ANNUAL MEETING: AUCKLAND, FEBRUARY 6-10, 1961

OHIO STATE UNIVERSITY
DEC 20 1960
LIBRARY

BRITISH MEDICAL JOURNAL

JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

SATURDAY NOVEMBER 19 1960

TABLE OF CONTENTS

Some Dermatological Hazards of To-day F. RAY BETTLEY, M.D., F.R.C.P. 1467
Oliguric Renal Failure of Surgical Origin
RALPH SHACKMAN, M.B., F.R.C.S., M. D. MILNE, M.D., F.R.C.P., and N. W. STRUTHERS, F.R.C.S., F.R.C.S.Ed. 1473
Fate of 424 Patients with Pneumonia and Bronchitis JOHN FRY, M.D., F.R.C.S. 1483
Hypoxia and Thoracic Scoliosis D. B. SHAW, M.D., M.R.C.P., M.R.C.P.Ed., and JOHN READ, M.D., M.R.C.P. 1486
Management of Acute Myocardial Infarction Complicated by Haematemesis
P. CURZEN, M.B., D.Obst.R.C.O.G. 1489
Investigation into Methods of Collection of Urine for Culture from Men and Women
S. H. C. CLARKE, F.R.C.S. 1491
Subacute Combined Degeneration of the Cord after Partial Gastrectomy
J. D. E. KNOX, M.B., M.R.C.P.Ed., and I. W. DELAMORE, M.B., M.R.C.P.Ed. 1494
Prolapsed Cord S. A. SELIGMAN, M.B., F.R.C.S., M.R.C.O.G. 1496
Toxic Marrow Failure after Treatment of Carcinoma with Cytotoxic Drugs
IAN CAMPBELL CREE, M.B., F.R.C.S. 1499
A Case of Twin Anencephalic Pregnancy L. LEWIS, M.B., D.Obst.R.C.O.G. 1500

RECEIVED
DEC 23 1960
HEALTH CENTER LIBRARY

MEDICAL MEMORANDA

A Case of Cryptococcosis of the Colon. E. K. UNAT, M.D., M.P.H., B. PARS, M.D., and J. P. KOSYAK, M.D., F.A.C.S. 1501

BOOK REVIEWS 1503

GENERAL ARTICLES AND NEWS

The Drinking Driver. SIMON FREEMAN, L.R.C.P.&S.Ed., L.R.F.P.S. 1513
Legality of Sterilization 1516
To-day's Drugs 1520
BRITISH ORTHOPAEDIC ASSOCIATION 1518
EARLY SURGERY 1519
A "STAND-SIT" CHAIR 1519
MEDICAL NOTES IN PARLIAMENT 1530
VITAL STATISTICS 1533
MEDICAL NEWS 1534
BIRTHS, MARRIAGES, AND DEATHS 1536
QUESTIONS AND COMMENTS 1537

OBITUARY

W. E. R. Dimond, C.I.E., C.B.E., L.R.C.P.&S.I., D.P.H. 1528
C. W. A. Kimbell, M.B., Ch.B., F.R.C.S.Ed., F.R.C.O.G. 1528
Sir John Goodwin, K.C.B., K.C.M.G., D.S.O., Hon.D.Sc., F.R.C.S., Hon.F.R.C.S.Ed. 1529

MEDICO-LEGAL

Inquest: Talc Pneumoconiosis 1531

LEADING ARTICLES

Renal Failure and the Artificial Kidney 1507
Vitamin - B$_{12}$ Neuropathy after Gastrectomy 1507
The Consultants' Voice 1508

ANNOTATIONS

Legality of Sterilization 1510
Humidity and Transmission of Viruses 1510
The Nation's Health in 1959 1511
Insulin 1511
W.H.O.'s Work in Europe 1512
The New Zealand Meeting 1512

CORRESPONDENCE

White Mouse Medicine. HUGH SINCLAIR, D.M. 1520
Vitaminized Cordials and Teeth. G. B. WINTER, D.C.H. 1521

SUPPLEMENT

Full Contents on First Page of Supplement

Annual Meeting, Auckland, New Zealand: Programme 203
Central Consultants and Specialists Committee 208
Joint Consultants Committee 212
Correspondence:
Representation of Regional Consultants. V. COTTON CORNWALL, M.D., and others 212
£1m. Reserved. J. C. H. BIRD, M.B. 213

CORRESPONDENCE—*contd.*

Recognition of Intoxication. J. C. PRESTWICH, M.R.C.P. 1521
Service Overseas. JOHN HARKNESS, F.R.C.S.Ed. 1522
False-positives with "Phenistix." S. GOLD, M.B., and others 1522
Congenital Ichthyosis, Spastic Diplegia, and Mental Deficiency. T. COLVER, M.D., and JOAN T. GRAHAM, D.C.H. 1522
Trichophyton sulphureum Infection. J. C. LOGAN, M.D., and PAUL R. DERBLAY, M.B. 1523
Coronary Artery Disease. C. F. ROSS, M.D. 1523
Frightening the Patient. D. H. ROPSCHITZ, D.P.M. 1523
Mental Health. S. H. F. HOWARD, M.B. 1524
Psychiatric Seminars. H. STEPHEN PASMORE, M.B. 1524
Psychiatry in General Practice. PHILIP HOPKINS, M.B.C.S. 1524
Preventive Medicine. ANTHONY EUSTACE, D.P.H. 1524
Fringe Medicine. BRIAN INGLIS; JAMES CYRIAX, M.D. 1525
Soap and the Skin. K. D. CROW, M.R.C.P. 1526
Personal Record Cards. R. SCHOFIELD, M.B. 1526
Not a Day Too Soon. S. J. G. SPENCER, D.M. 1527
Marksmanship and Crossed Laterality. J. R. ARMSTRONG, F.R.C.S.; J. W. F. LUMSDEN, M.B.; A. J. PALMER 1527

BRITISH MEDICAL ASSOCIATION, TAVISTOCK SQUARE, LONDON W.C.1

No. 5211, WEEKLY, PRICE 1/- Copyright © 1960 REGISTERED AS A NEWSPAPER

BUFFERIN RELIEVES RHEUMATIC AND ARTHRITIC PAINS WITHOUT CAUSING GASTRIC UPSET

BUFFERIN contains the exclusive combination of antacids called Di-Al-uminate. This prevents gastric distress even when taken in massive doses as for rheumatism and arthritis.

A clinical investigation carried out at the Robert Breck Brigham Hospital in Boston showed that 70% of arthritics who had a proved intolerance to straight aspirin were able to take BUFFERIN without gastric distress. (*Bufferin in the Management of Rheumatic Arthritis, J.A.M.A.* 158 : 386, *June* 4, 1955.)

SPEED OF ACTION – BUFFERIN works twice as fast as plain, non-soluble aspirin. *The Lancet, Feb.* 6, 1960.

BUFFERIN has no equivalent in the B.P. or National Formulary and is prescribable on E.C. 10's.

ACTS TWICE AS FAST AS ASPIRIN
BUFFERIN
ANTACID ANALGESIC
DOSAGE:
1 or 2 tablets, 3 or 4 times daily, as needed
BRISTOL-MYERS CO. LTD
LONDON & NEW YORK

Please write for free samples to Dept. T1, Bristol-Myers Co. Ltd., Stonefield Way, South Ruislip, Middlesex

BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 19 1960

SOME DERMATOLOGICAL HAZARDS OF TO-DAY*

BY

F. RAY BETTLEY, T.D., M.D., F.R.C.P.

Physician for Diseases of the Skin, the Middlesex Hospital, London

When the Chadwick Trustees paid me the honour of inviting me to deliver the Malcolm Morris Lecture they suggested that its subject should be related to skin hazards of to-day. It is indeed most appropriate to reflect in this way the great interest which Morris at all times showed in preventive medicine both in relation to dermatology and in wider fields. One's first thought, therefore, was to ask what had been the outstanding changes in recent times in relation to which dermatological risk may arise; and it is not merely because of the association with St. Mary's Hospital and Medical School that the development of antibiotics springs to mind as a major advance in human progress in our time.

I wonder whether there is any drug or method of treatment which is entirely free from the drawback of some undesired effect. Penicillin has proved to be, as it seems, completely without toxicity in ordinary therapeutic doses, but it has become familiar to dermatologists as an antigen inducing allergic sensitivity which manifests itself in the skin more often than in other ways.

Penicillin Urticaria

I think the experience of most of us is that urticaria is the most common cutaneous eruption to occur in patients who are receiving penicillin. Most often it appears four or five days after the beginning of treatment, and its duration is very variable. Although in most cases the eruption is of short duration—clearing up after a few days, as might be expected—it is common for the rash to last for two to three months or even longer, although penicillin treatment has of course been stopped. This is a strange feature of penicillin urticaria, and one which urgently requires some explanation. When one remembers the rapid excretion of penicillin this prolongation of urticaria for several weeks or for a few months, as is often observed, is not easy to understand. It is axiomatic that an allergic reaction does not take place in the absence of the allergen. Four possible explanations come to mind: first, that penicillin or some secondary product which is the allergen may be very slowly eliminated, perhaps from a depot injection; second, that penicillin is still being encountered from other continuing sources; third, that the urticaria is not due to penicillin but to some other antigen; and fourth, that the urticaria is not based upon an allergic mechanism at all.

*The Malcolm Morris Lecture read at St. Mary's Hospital Medical School on December 10, 1959.

As regards the first possibility, the extreme solubility and the rapid absorption and excretion of penicillin at one time constituted a disadvantage. Delayed absorption which may be brought about by the use of slow-absorption vehicles or by combination with procaine will usually maintain measurable quantities of penicillin in the body up to 24 to 48 hours, but the rate of fall of detectable blood levels makes it highly improbable that any penicillin would remain in the body for weeks or months after injection (Florey *et al.*, 1949).

Penicillin Reactions from Milk

The second possibility, of continuing exposure to penicillin from less obvious or from non-therapeutic sources, brings to mind particularly the production of penicillin reactions by milk, to which Vickers *et al.* (1958) drew attention in this country. It has been known for ten years that when penicillin is used for the treatment of mastitis in cows some of the antibiotic enters the milk. In recent years, however, the amount of penicillin reaching milk in England is diminishing, partly because penicillin treatment is not so widely used as formerly, and partly because mass treatments of cows, which were popular at one time, are now seldom given.

Zimmerman (1959) mentions a concentration of penicillin in milk of 550 units/quart—that is, about ½ unit/ml. In the first case described by Vickers *et al.* the patient was consuming milk with a concentration of 4 units/ml. Even with less concentration than this it is easy for several hundred units to be drunk daily, and there is no doubt that this would be enough to evoke urticaria or more serious reactions in a hypersensitive subject. In fact, when penicillin is encountered in milk at all in this country the quantity in pooled milk is not likely to exceed 1 unit/ml.

The published cases—for example, those of Vickers *et al.* and of Zimmerman—indicate sufficiently that when allergy is initiated by penicillin in ordinary therapeutic doses the reactions may be prolonged or produced anew by consumption of these much smaller doses, and that this effect may continue indefinitely. But there is a further point of considerable importance: granted that milk may provide enough penicillin to *elicit* an allergic response, is the dose sufficient to *initiate* sensitization and to give rise to penicillin allergy in a person who has never received penicillin in therapeutic doses? I am not aware of any case in which this has been known to occur; but presumably

the possibility exists, for the quantity of some allergens required to induce allergic sensitivity in the first instance can be extremely small. If we accept the possibility that penicillin allergy may thus arise without penicillin treatment having been given, it means that before giving penicillin treatment we must inquire not only into previous reactions which may have followed the known use of penicillin but into any allergic reaction the cause of which was not identified and which might therefore have been produced by penicillin unwittingly taken in milk or milk products. It is evidently going to be very easy to overlook this type of case.

In most cases of penicillin urticaria the eruption ceases spontaneously after a few months and does not continue or relapse indefinitely as one might expect if milk penicillin were responsible. Because of this, and of the comparatively uncommon presence of penicillin in our milk nowadays, I do not suppose that this factor is often present, though the possibility should evidently not be forgotten.

Role of Impurities

My third suggestion was that penicillin itself may not indeed be the allergen: the precise identification of penicillin as a cause of urticaria is not easy. We have for a long time known how common it is for patients to attribute urticaria to a certain food on the basis of a single attack and how often this is afterwards disproved. In most cases when patients tell us they are allergic to penicillin and when hospital notes are emblazoned with this warning, the diagnosis is based on exactly the same kind of single observation and is equally tenuous. The incidence of penicillin urticaria varies considerably in relation to the disease under treatment; this may depend upon factors such as dosage, but it should make us pause also to ask whether the nature of the disease may not play some part. Further, even if we are correct in assuming that urticaria appearing in these circumstances is due to penicillin injections we must still not overlook the possible part played by impurities and by the vehicle. Reactions were more common with the beeswax-based slow-absorption vehicle, probably due to allergy to beeswax or to some material such as pollens which it contains. More modern vehicles, and the combination of penicillin with procaine, are less allergenic but not altogether free from this possibility.

Leaving aside allergy to the vehicle, however, Florey (1952) was able to say that there was yet no clear-cut proof that penicillin rather than impurities was the cause of penicillin reactions. She draws attention to the much greater frequency of reactions and of positive intradermal tests obtained with amorphous (impure) penicillin than with the more pure crystalline product; even different batches of crystalline penicillin give variable skin-test results, suggesting that these depend upon the presence of unidentified contaminants. This may explain the unreliability of skin tests in the diagnosis of individual cases, which is generally accepted. It is conceivable that the impurities are more slowly absorbed or more slowly excreted, and that this may account for the strange chronicity of some cases.

The value of skin tests—scratch tests or intradermal—in the diagnosis of subacute or chronic urticaria is in general notoriously little. After the first onset in relation to exposure to the possible antigen the diagnosis has to be confirmed by the reappearance of urticaria after another exposure. In the case of suspected penicillin allergy re-exposure does not usually occur, since we know that in these circumstances dangerous anaphylactoid reactions are possible, but it may nevertheless happen accidentally. I expect many of us have met cases—I have seen three or four—where patients thought to be allergic to penicillin because of urticaria which followed treatment have mistakenly been given penicillin again, and without the slightest reaction. From what we know of true allergic urticaria, spontaneous desensitization is not a likely explanation of this, and it is more likely that the presumptive diagnosis was wrong. Zimmerman (1959) has reviewed the use of penicillinase in diagnosis, a cessation of symptoms after the administration of penicillinase indicating penicillin as the responsible agent. This depends, of course, upon the assumption that the penicillinase in question has no action upon the impurities and is quite specific for penicillin. Since the impurities have not been identified, it is presumably impossible to justify this assumption.

We must conclude, on consideration of these various facts, that if the urticaria which follows penicillin treatment is truly allergic then the allergen is not necessarily always penicillin itself; indeed, as Florey said, we do not even know for certain whether any of these cases are based upon specific allergy to penicillin alone. The idea that these impurities may linger in the body for weeks and months after an injection and thus prolong urticaria, however, is difficult to accept.

Is the Allergen a Metabolite?

There remains the possibility that this kind of urticaria is not based upon an allergic mechanism at all; or that the allergen is not a foreign substance but is a metabolite normally produced in the tissues.

In cholinergic urticaria there exists a hypersensitivity to acetylcholine which is transferred by the Prausnitz–Küstner method, and which may therefore be accepted as depending upon an allergic mechanism. Factitious urticaria produced by stroking the skin or by other physical stimuli may depend upon allergy to some substance which is normally released from the tissues under the appropriate stimulus. Since this allergen has not been identified, this remains an assumption, which is supported by the fact that this wealing can be passively transferred by injecting the serum of the patient into a normal person. Pillsbury *et al.* (1956), however, regard this type of urticaria as non-allergic How factitious urticaria arises is completely unknown.

In 12 cases of this kind which I investigated very thoroughly no other physical abnormality could be detected, but in all of them there was considerable psychological stress though no uniform psychiatric pattern. This finding conforms with the commonly held view that factitious urticaria is often psychogenic, an assumption which has been criticized, and I believe very rightly, by Rothman and Walker (1950). In this connexion the observations of Kalz and Prichard (1952) are of the greatest interest. They examined the cutaneous vascular response to stroking the skin before and after the administration of penicillin. In only 15 of their 100 subjects did this remain unchanged. 9.7% of those tested actually developed factitious urticaria: 21% produced a peculiar papular follicular response which may have been urticarial but may have been due to pilomotor action. The remainder gave an

erythematous response, normal in type but of greater degree than before penicillin treatment. Kalz and Prichard suggest that penicillin may have some cholinergic action.

Florey *et al.* (1949) mention the suggestion that in guinea-pigs penicillin may have a toxic action on capillaries and venules, but no such effect has been observed in man. Among the occasional reactions to penicillin they mention flushing of the skin: its cause is obscure, and it seems less common since purer penicillin has become available. The observations of Kalz and Prichard do, however, suggest either that penicillin has some direct action on cutaneous vascular response or that it somehow promotes the development of allergy to autogenous metabolites. It may be significant that seven of their patients developed epidermal contact sensitivity (to substances other than penicillin) during the 12-months follow-up period; these authors point out that no conclusions can be drawn from that isolated observation, but it is at least suggestive that penicillin may have the property of promoting the development of allergy to unrelated substances.

Chronic Urticaria

What I have said about factitious urticaria may or may not apply to ordinary chronic urticaria. In most of these cases specific sensitivity cannot be identified. If the eruption is produced by an autogenous antigen then the nature of this and the stimulus which causes its release are quite unknown. It may be that chronic urticaria does not always depend upon an antigen–antibody reaction at all, but upon some other mechanism which leads to transient vasodilatation and increased capillary permeability; and that penicillin, just as it provokes factitious urticaria, may lead to the development of chronic urticaria which, once established, does not need the continuance of an exogenous antigen. This suggestion implies that in those cases where penicillin urticaria continues for some weeks or longer there is not, and never has been, penicillin allergy; but that penicillin has the property of inducing a state of chronic urticaria, the mechanism of which may not be different from that of ordinary chronic urticaria of obscure origin. The conclusion which I favour is that in at least a goodly proportion of cases the action of penicillin has been to induce the condition of ordinary chronic urticaria in which an allergen cannot be convincingly identified, which is suppressed with antihistamine drugs, and which eventually clears up spontaneously.

The results of skin tests are confusing and unreliable, and we can clearly place no confidence in them. Dangerous anaphylactoid reactions may result in highly sensitive subjects, and otherwise, whether tests are positive or negative, they give no final indication in diagnosis nor guide to procedure. There must be many patients to whom penicillin is denied because of the fear of severe allergic reactions, particularly atopic subjects, who appear to suffer more severely in this respect. In many cases penicillin could almost certainly be given without any reaction following, but by present methods it is very difficult to distinguish genuine penicillin sensitivity from presumed, and wrongly presumed, sensitivity. The development of penicillin allergy has proved to be a troublesome drawback, and if this antibiotic is to retain its prominent place further investigation must indicate a way in which this complication may be avoided or minimized.

Sensitivity to Epoxy Resins

The synthetic resins, because of several remarkable properties, have already made for themselves a secure place in a considerable variety of industries. Since they are very potent epidermal sensitizers an important place as a cause of industrial dermatitis seems to be equally assured. The subject of epoxy-resin dermatitis has been fully dealt with by Grandjean (1957) and by Calnan (1958). In spite of this the awareness of these dangers is slow to be realized in industry.

In 1959 I saw two french-polishers who had developed dermatitis of the hands and fingers. They were both between 40 and 50 years of age, and had been working as french-polishers for over 25 years. During the previous two years or so they had been engaged in polishing wooden doors and panelling on the outside of a building for which they used a special material which was described as a weather-proof polish. I found upon inquiry that the polish they had been using, instead of being the relatively harmless shellac mixture, contained an amino-resin which in both cases had produced the dermatitis. These men may well return to ordinary french-polishing in due course, but, clearly, if they are to handle amino-resins they should take greater precautions than when they are handling the ordinary materials of their trade. Another patient whom I saw last year worked as a transformer-core builder. In assembling the transformer cores he mixed an epoxy resin to apply to them. He mixed the resin with hardener on a slab with his bare hands, kneading a mass the size of a football, as a baker kneads dough, for about half an hour, afterwards moulding it by hand around the core. He developed an allergic dermatitis due to the resin.

In none of these cases, as in many others we still see, had the workers been given any warning of the risk of dermatitis, and they were consequently handling the resins with the indifference that is natural in ordinary work. In preventing this sensitization dermatitis, the only sure safeguard is avoidance of contact. When these substances are being used it is imperative that the skin is not brought into contact with them. Implicit in this also is the proviso that the resins must not be allowed to contaminate benches, door-handles, and machinery, in order that accidental and unnoticed contact may not occur. Grandjean found that atmospheric contamination was so slight as to be unmeasurable, so that risk other than by direct contact is negligible. Sometimes much is made of protection with barrier creams, and Grandjean believes that they offer a certain amount of protection.

Barrier Creams

In general, the idea of applying to the hands a protective layer before starting work is not new. Prosser White (1915) mentions the use of a fatty application to protect the skin, mostly against water-soluble irritants.

Barrier creams acquired their real lease of life when they received official support from a Ministry of Labour pamphlet in 1946. In the years that have followed, the use of these preparations has increased enormously, and has received support from dermatologists far beyond what is justified by the evidence. In theory the conception of a barrier cream is excellent; it is to form an invisible, impalpable, inodorous, and innocuous layer on the skin, flexible and unbreakable, which will allow

perspiration and evaporation to take place from the skin, but which is, above all, impermeable from the outside. It resists removal during work but is easily removable in ordinary washing. To believe in a substance so nearly bordering on the miraculous requires either a naive credulity or the most conclusive scientific evidence. The latter certainly does not exist.

The properties chiefly claimed for an efficient barrier cream are: (1) effective barrier against irritants and sensitizers; (2) after application it becomes invisible and impalpable; (3) it does not, by greasiness or otherwise, interfere with the work; (4) it is easily removed with ordinary washing, but it is not removed by work exposure over a period of at least a few hours; and (5) it is non-irritating to the normal skin.

Tests of various kinds have been proposed. First, there is the purely laboratory test such as that used by Sadler and Marriott (1946). They smeared barrier cream on to paper and then observed the transmission of various substances through this layer. Their results were very variable, and the authors themselves do not appear to place much reliance on them.

Schwartz *et al.* (1946) elaborated a method by which a continuous layer of cream of standard thickness was sandwiched between two layers of paper; the layer of cream was of uniform thickness—about 0.13 mm., or 5/1000 in. On the upper layer of paper they placed caustic soda or hydrochloric acid solution, and on the lower an indicator. They measured the time taken for the indicator to show transmission of alkali or acid through the layer of cream. In order to study the passage of liquid paraffin they stained the liquid paraffin with Sudan red. Among their results they found, first, that ordinary soft paraffin and anhydrous lanolin were as good as any of the 27 barrier creams they tested, and indeed better than most. Second, that the creams were not as the makers claimed; for example, some creams claimed to be water-repellent showed themselves to be more effective against oil than against water. A third point of considerable importance was the influence of humidity and temperature. As these rose above normal laboratory levels the efficiency of the creams fell off—in other words, they had less barrier effect as conditions came closer to those of the skin surface.

Porter (1959) attempted to make Sadler and Marriott's method more realistic by using an apparatus which subjected the paper on which the cream was smeared to a repeated bending movement. His results also were disappointing, and, like Schwartz *et al.*, he found that such value as a cream might have was not always that claimed by the maker. In general, he found little to support the effectiveness claimed for the 11 creams he examined.

These tests are of course highly artificial. They take no account of friction and sweating, and it seems improbable that a layer of cream 5/1000 in. (0.13 mm.) thick will lie on the skin invisible but persistent during some hours of work. Many of the creams tested by Schwartz *et al.* penetrated even this substantial layer in less than half an hour. How long would an invisible layer on the hands provide a barrier? One may conclude that a cream which does not pass such a test with a very high performance cannot be expected to have any practical value, and, even on this lax criterion alone, many present-day barrier creams must be rejected.

A more realistic type of test is that devised by Cruickshank (1948). He applied barrier creams to the skin in the prescribed fashion, and then applied mineral oil. After a given time he washed off the oil, and by examination under ultra-violet light estimated the degree to which the oil had penetrated to the skin surface. As Cruickshank himself pointed out, this test takes no account of friction and sweating, which are very important factors under normal working conditions, and would therefore tend to give optimistic results. Nevertheless, Cruickshank concluded that no barrier cream gave satisfactory protection. His best result was with a soap-based cream very thickly applied; but, as I shall indicate later, the use of soap-based creams at any time is of doubtful wisdom for other reasons, even if they do provide a better barrier than alternative formulae. Cruickshank concluded from his tests that reliance could not be placed on protective applications—this in spite of the fact that his tests were admittedly less stringent than conditions of use.

Morris and Maloof (1953) made a similar test, applying cutting-oil to a skin surface prepared with barrier cream. They found that, of 24 barrier creams tested, 20 were penetrated within three minutes. Of the four which resisted three minutes' exposure, two were later tested again with 30 minutes' exposure and found to be penetrated. This seems an astonishingly poor performance for creams which are supposed to give substantial protection for several hours at a time.

Skin-cleansing—a Complex Problem

I may at this juncture mention one argument often put forward in support of barrier creams—namely, that their use before work facilitates cleaning the skin afterwards. In some cases this claim is obviously untenable. Morris (1954) quotes a maker's claim that a certain cream protects against soap and household cleansers and yet is easily removed with soap and water when desired. Cruickshank, in the experiments referred to, paid attention to this point, and concluded that soap-based barrier creams did not facilitate the removal of mineral oil, although such a cream is particularly the kind which might be expected to have this effect.

The problem of cleansing the skin is a complex one, and clearly depends to a considerable extent on the nature of the dirt to be removed. What is meant here is presumably the removal of ground-in solid or oily particles which have entered the hair follicles and possibly the sweat-duct ostia and the minute interstices of the corneous layer during prolonged exposure and aided by friction—under conditions, that is, which were not reproduced in Cruickshank's experiments. Presumably, this kind of contamination can be prevented by filling the pores and fissures first with solid particles—for example, kaolin—or with soap or with some fatty material. This is an acceptable practice only if we know that the substances we apply are less harmful and more easily removed than the dirt to which the skin is afterwards exposed. Otherwise the state will arise where visible dirt is removed but a persistent layer of barrier cream remains to produce the consequences of follicular blockage, sweat-duct occlusion, and irritation of the skin surface. When Morris and Maloof (1953) were testing the effectiveness of barrier creams they found that, of 24 barrier creams they examined, five could not be washed off the skin with any ordinary skin-cleanser. This may well be what happens with silicone

creams, which appear to resist very strongly removal with soap and water (Suskind, 1955). Although workmen often say that barrier creams make cleaning the hands easier, I have not been able to find any evidence of exactly how this is achieved or how thoroughly in these circumstances the barrier cream itself has been removed.

Practical Aspects of Use of Barrier Creams

Turning to the more practical aspects, many writers, in general terms, give support to the use of barrier creams. For example, Schwartz (1955) lists the properties which a barrier cream should possess, but does not explicitly say which, if any, products actually have these qualities. Horner (1950) supports the use of barrier creams, but without seeming enthusiastic; she considers that their value in certain circumstances must be acknowledged, but I am not certain that these circumstances are easily achieved or likely to be realized in ordinary working conditions in the average factory.

Given favourable conditions a barrier effect can no doubt be obtained. Talbot *et al.* (1951) used a silicone barrier cream for the treatment of napkin rash, of skin irritation around colostomy openings, and comparable situations where the skin needs to be protected against discharges and secretions. They obtained satisfactory protection in 58 out of 61 cases. In this kind of use there is not the same tendency for the cream to be rubbed off the skin as there is with a workman's hands, and a comparatively thick layer can usually be kept on the skin surface for several hours, covered with a dressing if need be.

Eventually, I suggest, it comes to this—that the only evidence that will really indicate the practical value of a barrier cream must be derived from testing and observing in actual work, the cream being used over a prolonged period by real workmen. A comparison must then be made between the incidence of skin disease with and without the cream, other conditions being of course kept constant.

Silicone Cream

Suskind (1954) made an evaluation of a silicone cream in a factory where aircraft engines were being made. Exposures to oils, solvents, and irritants were many and various. The comparison here was made of the condition of the workers' skin before and during the use of a barrier cream. The conditions of work before the experiment had apparently given rise to a good deal of minor skin irritation, and this was observed to clear up when the barrier cream was brought into use. Simultaneously with the cream, however, a special cleanser (sodium lauryl sulphoacetate) was introduced, presumably replacing ordinary soap and other cleansing agents. No controls were run during the time of the experiment, and Suskind's promising and apparently favourable results are therefore not easy to interpret.

Morris (1954), on the other hand, could observe very little protection from the use of a silicone cream. He used a cream of this type in patients known to have allergic epidermal sensitivity. Patch tests were applied to skin which had been previously treated with barrier cream and the results compared with patch tests on untreated skin. No significant effect could be seen; in five cases there was no difference, in seven the prepared skin reacted less, but in six the treated skin reacted more strongly—an important observation to which I shall refer later. Three patients with specific contact sensitivity to a substance encountered at work were returned to work after their eruption had healed with the use of a barrier cream. Their dermatitis relapsed at once, the cream apparently affording not the slightest protection.

Lack of Experimental Evidence

Evidence of the effect of barrier creams in actual use is in fact extremely difficult to obtain. From time to time, no doubt, a high incidence of industrial dermatitis in a factory has led to the introduction of barrier creams and the incidence of skin disease may have fallen afterwards. Almost always there are, however, several other factors involved—altered methods of work, medical supervision, improved washing facilities, and the like—and it is seldom that these are carefully kept constant so that the effect of barrier cream can be isolated and assessed.

Great care would have to be taken to ensure that groups of workers using different creams were matched in age, sex, and other relevant factors, and that their work, washing facilities, and other circumstances were precisely the same. The experiment would need to be carried out with a sufficiently large number of people and for a sufficiently long time, for the irregular and unpredictable incidence of industrial dermatitis could lead to false conclusions. The few experiments of which I have read in which barrier creams have been assessed in the factory have not taken account of all these factors, and the statistical validity of results has been difficult to assess because of the confusion by other methods which have been introduced at the same time. For this reason I do not feel satisfied that clear-cut evidence of their effectiveness is available. Such evidence as exists is fragmentary, contradictory, and inconclusive.

The *B.P. Codex* Revision Committee (1954) published a report from its Barrier Substances Subcommittee. At this time four formulae for barrier creams were suggested as being likely to afford some protection from industrial hazards. The subcommittee recommended that before these formulae were included in the *Codex* an opportunity should be given for wider experimental use and comment by interested parties. Whether or not these formulae have been subjected to the examination suggested, or to what extent, I cannot say. It appears to have been intended at the time that the secretary of the Barrier Substances Subcommittee should in due course be informed of experiments and of their results. A recent inquiry I made revealed that no information had been forthcoming. These four formulae, like many other proprietary creams whose composition is secret, remain insufficiently tested and assessed.

Irritancy

There remains the question of irritancy. The Barrier Substances Subcommittee to which I have referred recommended four formulae. One of these was an "oil and solvent barrier," and it contained 12% of hard soap. It is, of course, very well known that soap is a primary skin irritant, and that if 48-hour patch tests are carried out with soap in a concentration even as low as 1% a substantial number of positive results are obtained. It is not surprising that patch tests carried out by Dr. Elaine Donoghue and me on 29 normal

subjects using this recommended barrier cream gave 25 positive results indicating primary irritancy. Although it is usually harmless to use soap for washing when a concentration of about 5% remains in contact with the skin for only a few moments, it is doubtful whether 12% soap can be applied in the form of a barrier cream without a serious risk of primary irritation. Particularly is this so if the cream remains on the skin, as it is supposed to, throughout the working day.

The recommendation in support of barrier creams made by the Ministry of Labour and National Service (1946) says that preparations with a *p*H much above or below 5.5 to 6.5 are apt to be irritating. The "oil and solvent barrier" formula when diluted 25% gave a *p*H of 9.2. Sadler and Marriott (1946) examined eight barrier creams and immediately rejected three because their *p*H was over 9. Two proprietary barrier creams on sale at present which I have tested give a *p*H over 9 in 10% solution, and thus it seems very probable that the inclusion of soap in oil-resistant barrier creams is still fairly common practice. If such a cream is thoroughly applied and remains on the skin throughout the working day, it seems probable that it will give rise to some degree of primary skin damage. This primary irritation may of course be mistaken for industrial dermatitis.

A minor degree of primary irritation of this sort may give rise to a condition somewhat resembling chapping, and may in itself give no great trouble. It is probable, however, that small fissures which form in the corneous layer may allow the entry of dirt and of irritants, and thus pave the way for the production of a more severe dermatitis by some other irritant or by a sensitizer. The other formulae mentioned by the subcommittee may be non-irritant, but the inclusion of triethanolamine is of doubtful wisdom, since this substance has been suspected of irritating the skin. Regarding proprietary barrier creams, one cannot speak in this respect as their formulae are secret. One may observe, however, that Tas (1957) obtained primary irritant reactions by patch-testing with several barrier creams; in the case of some creams, over 50% of subjects gave positive reactions. The problem of primary irritancy in barrier creams seems clearly not to have received sufficient attention from the makers.

Sensitization

Quite apart from visible and obvious signs of primary irritancy and damage to the epidermis, we must consider also the possible influence of barrier creams on the permeability of the skin to other substances. It is easy to appreciate that increased penetration into the epidermis increases the likelihood of sensitization to a substance applied on the surface (Rothman, 1954). Treatment of the skin with lipoid solvents, detergents, and emulsifiers is apt to increase absorption through the transepidermal barrier. This effect has been observed and proved in a number of ways. Skog (1958) determined the results of patch-testing with dinitrochlorbenzol on normal skin and on skin which had been pretreated with 2% soap. After treatment with soap increased reactions were obtained, a potentiation of the irritant effect of DNCB.

Kvorning and Svendsen (1956) showed that the addition of "teepol" to a chromium or nickel patch test lowered the threshold of reaction in sensitive subjects, presumably because teepol enables the metallic salt to reach the Malpighian layer more readily. A similar effect was noticed by Nilzen and Wikström (1955), in which lauryl sulphate appeared to increase the permeability of the skin to dichromate. Rabeau and Malangeau (1947) discuss the effect of wetting agents in promoting contact eczema, and suggest that this may be because the permeability of the epidermis is increased by these substances. Laug *et al.* (1947) also found that the addition of a wetting agent to an emulsified ointment increased its penetration, but they attributed this not to an alteration in the epidermis but to a diminution of particle-size in the ointment that was being applied.

Horner (1950) drew attention to the need for care in the choice of cream in the presence of toxic substances, and she mentioned that lanolin contained in a barrier cream may increase absorption. Jenkins (1948) found that the use of lanolin as a protective application actually increased the "smarts"—the acquired light sensitivity which results from contact of tar with the skin. He attributed this to the solubility of tar in lanolin bringing the tar into more intimate contact with the skin. In the case of tar this was easily recognized, since the smarts is a well-known symptom which appears soon after exposure. May I at this point recall that Morris (1954), in patch-testing known hypersensitive subjects, found that a proportion of them reacted more strongly if a barrier cream had been first applied? How often, one may ask, is the same mechanism in action when the effects are less immediately obvious? Consideration of these various aspects leads one to suppose that emulsifiers and wetting agents are all liable to have the effect of increasing absorption through the skin in appropriate circumstances. The modern formulation of barrier creams is, of course, not revealed, but it seems reasonable to surmise that many of them contain substances belonging to this category. Whether they are really diminishing the risks of dermatitis or whether they are adding to them remains unknown. In view of this complete uncertainty, it is unfortunate that barrier creams should have received such measure of support from doctors. The legal consequence of this has been that in many industries a failure to provide barrier cream is prima facie negligence of the employer to his employee, for which damages may be awarded.

Some time ago I learnt of a case where a man in contact with paraffin oil (kerosene) had good conditions of work and washing facilities which were acknowledged excellent, yet because this man developed a mild dermatitis lasting for two or three weeks—without later relapse—damages were awarded against his employer on the sole grounds that no barrier cream had been provided. Medical evidence in this case was largely non-committal, and the support given for barrier cream was lukewarm; the strong support came from the evidence of the technical director of a firm of barrier-cream manufacturers. This is in spite of the doubtful effectiveness of barrier creams against oil and solvents in general and against paraffin oil in particular; none of the recorded tests I have seen, even the favourable results of Suskind, show any protection against paraffin oil.

Conclusion

The courts of law can make judgment only on the evidence presented to them. I believe it should be our

task to make clear that the protection afforded by barrier creams is questionable, and that it has not yet been scientifically substantiated; we should demand that the experts employed by manufacturers publish the evidence on which their views are based in such a form and in such detail that it can be critically assessed; and we should insist that the formulae of these products are made known. The claims of those who make and sell these preparations are specious and their literature voluminous, but I have shared Porter's experience that these firms yield little information when one seeks the precise evidence on which their claims are based, and when one tries to find out the composition of their products.

I am not saying that all barrier creams are completely useless; only that we do not know and at present have no means of knowing. If this conclusion is correct, then no employer should be blamed or held negligent for failing to provide them. The present unsatisfactory situation is partly our fault, and we should reconsider our position. First, we should actively advocate the use of barrier cream only when we know that the proof of its value is soundly based (at the present time I suggest this means never); anything short of this should be regarded as an experiment and should be planned accordingly. Second, we should adhere to the general principle that we cannot recommend the use of an application whose exact composition is not made known to us. At the present time proprietary barrier creams are secret remedies.

References

B.P. Codex Revision Committee (1954). *Brit. med. J.*, **2**, 1044.
Calnan, C. D. (1958) *Trans. St. John's Hosp. derm. Soc. (Lond.)*, **40**, 12.
Cruickshank, C. N. D. (1948). *Brit. J. industr. Med.*, **5**, 204.
Florey, H. W., Chain, E., Heatley, N. G., Jennings, M. A., Sanders, A. G., Abraham, E. P., and Florey, M. E. (1949). *Antibiotics*. Oxford Univ. Press.
Florey, M. E. (1952). *The Clinical Application of Antibiotics*. Oxford Univ. Press.
Grandjean, E. (1957). *Brit. J. industr. Med.*, **14**, 1.
Horner, S. (1950). In *Modern Practice in Dermatology*. G. B. Mitchell-Heggs. Butterworth, London.
Jenkins, W. D. (1948). *Dermatoses Among Gas and Tar Workers*. Wright, Bristol.
Kalz, F., and Prichard, H. (1952). *A.M.A. Arch. Derm. Syph.*, **65**, 568.
Kvorning, S. A., and Svendsen, I. M. (1956). *J. invest. Derm.*, **26**, 421.
Laug, E. P., Vos, E. A., Kunze, F. M., and Umberger, E. J. (1947). *J. Pharmacol. exp. Ther.*, **89**, 52.
Ministry of Labour (Factories Dept.) Form 330, March, 1946.
Morris, G. E. (1954). *A.M.A. Arch. industr. Hyg.*, **9**, 194.
—— and Maloof, C. C. (1953). *Industr. Med. Surg.*, **22**, 327.
Nilzen, A., and Wikström, K. (1955). *Acta derm.-venereol. (Stockh.)*, **35**, 292.
Pillsbury, D. M., Shelley, W. B., and Kligman, A. M. (1956). *Dermatology*. Saunders, Philadelphia and London.
Porter, R. (1959). *Brit. J. Derm.*, **71**, 22.
Rabeau, H., and Malangeau, P. (1947). *Bull. Soc. franç. Derm. Syph.*, **57**, 385.
Rothman, S. (1954). *Physiology and Biochemistry of the Skin*. University of Chicago Press.
—— and Walker, S. A. (1950). *Int. Arch. Allergy*, **1**, 306.
Sadler, C. G. A., and Marriott, R. H. (1946). *Brit. med. J.*, **2**, 769.
Schwartz, L. (1955). *Prevention of Occupational Skin Diseases*. McGraw Hill Book Co., New York.
—— Mason, H. S., and Albritton, H. R. (1946). *Occup. Med.*, **1**, 376.
Skog, E. (1958). *Acta derm.-venereol. (Stockh.)*, **38**, 1.
Suskind, R. R. (1954). *A.M.A. Arch. industr. Hyg.*, **9**, 101.
—— (1955). *J. industr. Med. Surg.*, **24**, 413.
Talbot, J. R., MacGregor, J. K., and Crowe, F. W. (1951). *J. invest. Derm.*, **17**, 125.
Tas, J. (1957). Ibid., **29**, 223.
Vickers, H. R., Bagratuni, L., and Alexander, S. (1958). *Lancet*, **1**, 351.
White, R. P. (1915). *Occupational Affections of the Skin*. Lewis, London.
Zimmerman, M. C. (1959). *A.M.A. Arch. Derm.*, **79**, 1.

OLIGURIC RENAL FAILURE OF SURGICAL ORIGIN

BY

RALPH SHACKMAN, M.B., B.S., F.R.C.S.

M. D. MILNE, M.D., F.R.C.P.

AND

N. W. STRUTHERS, F.R.C.S., F.R.C.S.Ed.

From the Departments of Surgery and Medicine, Postgraduate Medical School of London, Hammersmith Hospital, London

Renal failure, an omnibus term used to describe events which follow inadequate renal control of the internal environment of the body, may develop as an acute phenomenon in patients with previously normal kidneys or in patients with overt or occult antecedent renal disease. In its acute oliguric form it is a relatively rare complication of major surgical and traumatic conditions, and, perhaps for this reason, may be temporarily overlooked. While a high fatality rate may be inevitable as a direct result of the primary condition, delayed recognition and inadequate treatment of the secondary acute renal failure makes the overall prognosis significantly worse.

Acute oliguric renal failure has been well documented during the years since the second world war (Legrain, 1951; Swann and Merrill, 1953; Aoyama and Kolff, 1957; Hamburger *et al.*, 1958; Salisbury, 1958; Parsons and McCracken, 1959), but, apart from the wartime experiences recorded by Smith *et al.* (1955), Balch *et al.* (1955), and others, the surgical aspect of the problem, in the main, has received little specific attention. This despite the fact that a significant proportion of all cases of acute oliguric renal failure have a "surgical" basis.

Moreover, conclusions drawn from experience gained in the management of "medical" and "obstetric" patients with acute renal failure are not necessarily applicable: not only is the prognosis significantly worse in the surgical patients but their detailed management is often much more complicated and difficult. Oral feeding may be impracticable. Abdominal distension or vomiting may require prolonged use of an indwelling gastric tube with risk of pharyngo-oesophageal irritation, ulceration, bleeding, and the development of chest infection. Repeated gastro-intestinal aspiration may add to the difficulties of fluid and electrolyte management. Poor wound-healing, wound dehiscence, infection, secondary haemorrhage, and the development of intestinal fistula may occur. Incontinence may develop, and it may be virtually impossible to prevent the development of pressure sores.

The so-called "conservative" management of patients with acute oliguric renal failure (Borst, 1948; Bull *et al.*, 1949), by fluid and protein restriction, administration of carbohydrate, insulin, and calcium (Meroney and Herndon, 1954), ion-exchange resins (Evans *et al.*, 1953), and sodium lactate, as a rule easily applicable to "medical" and "obstetric" cases, is used whenever possible: there are, however, some potential difficulties in the "surgical" cases. It may not be easy to assess extrarenal fluid and electrolyte losses from fistulae, skin burns, or skin and intestinal ulceration: oral ion-exchange resins may not be effective in cases of ileus (they may even be dangerous because gastric casts

may form); and it may be difficult to find adequate veins for continued parenteral treatment and daily blood-sampling for biochemical control, especially when multiple limb injuries are present and plaster-of-Paris casts are required. Peritoneal dialysis may be impracticable and even dangerous in post-operative abdominal cases. And when haemodialysis by an artificial kidney is required heparinization in the presence of recent wounds or intracranial injury may be dangerous. It may be difficult to gain access to suitable veins or arteries for the haemodialysis, and the dialysis may have to be carried out without continual systolic and diastolic blood-pressure recordings.

Acute oliguric renal failure is more a functional designation than a diagnosis. It connotes an acute onset, an inadequate urine output, and renal inability to maintain the internal environment of the body: it does not imply a specific pathological lesion. In normal circumstances, when the kidneys are not diseased, urine volumes of 400 to 500 ml./24 hours may be adequate to rid the body of unwanted products of protein metabolism such as urea, potassium and inorganic acids such as phosphates and sulphates: when the urine volumes are less than 400 to 500 ml./24 hours the condition is designated oliguria. Oliguria may be classified as (*a*) extrarenal pre-renal, (*b*) renal, and (*c*) post-renal obstructive (Aird, 1957), or considered to result from (*a*) extrinsic renal failure (which includes pre-renal and post-renal oliguria), and (*b*) intrinsic renal failure (Waugh, 1959).

Polyuric renal failure may occur in surgical patients. It may complicate the recovery stage of acute tubular necrosis, the commonest form of acute intrinsic renal failure, it may follow instrumental or surgical relief of post-renal obstruction (see below), and it may present as a manifestation of chronic renal disease.

Extrinsic Renal Failure

Pre-renal Oliguria

Pre-renal oliguria, sometimes called extrarenal azotaemia but preferably designated acute renal circulatory failure, occurs when the renal blood flow and glomerular filtration rate are depressed. The condition may complicate the oligaemia of haemorrhage or it may follow plasma depletion in patients with extensive burns or ulceration of the skin or bowel. It may be a sequel to water and sodium depletion in gastro-intestinal conditions, particularly when there is excessive vomiting, gastric aspiration, diarrhoea, or loss through intestinal, biliary, or pancreatic fistulae. It may complicate hypercalcuria, or metabolic alkalosis and hypokalaemia.

The urine in pre-renal oliguria has a relatively high specific gravity, usually not less than 1018, a urea concentration not less than 1.5 g./100 ml., and a sodium concentration not greater than 30 mEq/l. Overt clinical evidence of blood loss, plasma loss, or water and sodium depletion may be present, and hypotension, tachycardia, and a lax skin may be prominent features; a high P.C.V. and a raised serum sodium concentration reflect dehydration.

The diagnosis of pre-renal oliguria is confirmed when, after replacement of blood, plasma, or water and sodium, there is a good diuresis and rapid restitution of the abnormal blood biochemistry. However, prolonged vasoconstriction of the renal vessels, a homoeostatic mechanism invoked to maintain blood-pressure, may cause acute tubular necrosis, an ischaemic lesion of the kidneys which is probably the commonest cause of acute intrinsic renal failure and a much more serious condition.

Pre-renal extrinsic renal failure may occur in patients with known or previously unsuspected chronic renal disease. In such circumstances a sustained diuresis, at least 3 l./24 hours, is required before unwanted products of protein metabolism can be cleared: the urine specific gravity is then low, usually not greater than 1014, and the urea concentration less than 1 g./100 ml. This urine may thus resemble qualitatively that excreted in the oliguric phase of acute tubular necrosis.

Post-renal Obstructive Oliguria

Post-renal oliguria is an obstructive oliguria. The obstruction is often complete, functionally if not organically, and there is anuria rather than oliguria. It is to be distinguished from retention of urine, which complicates prostatic, bladder-neck, or urethral obstruction and which is manifested by the presence of a distended bladder; this physical sign may, however, be obscure in obese patients, particularly post-operative and traumatic cases, and urethral catheterization may be needed for diagnosis.

Except for those rare cases which follow accidental injury during pelvic surgery, bilateral ureteric lesions responsible for the development of post-renal oliguria are only rarely simultaneous: in most instances one ureter has been previously subjected to a "silent" obstruction for some time, and only subsequently, when the second ureter becomes involved, does the condition reveal itself by the onset of oliguria or anuria. This sequence of events may be seen in cases of carcinoma of the cervix, prostate, and bladder.

When oliguria or anuria develops as a sequel to calculous obstruction of a solitary functioning kidney, in cases of congenital absence of one kidney the aetiology may be obscure until cystoscopic examination reveals trigonal deficiency and absence of one ureteric orifice: the problem is not as great when it is known that nephrectomy has preceded the event. Although it is possible for a patient with a solitary functioning kidney to develop acute intrinsic renal failure from acute tubular necrosis, or indeed acute nephritis or cortical necrosis, loin pain and tenderness, a palpable kidney, anuria rather than oliguria, and radiographic evidence of calculi strongly suggest post-renal obstruction. Unilateral calculous obstruction associated with reflex inhibition of function of the contralateral organ is a great rarity, and the exact mechanism responsible for this phenomenon remains obscure.

Cystoscopy, ureteric catheterization, and retrograde pyelography should be attempted whenever the diagnosis is in doubt (it is unwise to omit pyelography and to rely only on conclusions drawn from the passage of ureteric catheters), but oedema and bruising of the bladder base may obscure the ureteric orifices in post-operative cases and it may be impossible to catheterize the ureters. Ureteric catheterization may also fail when the ureters are lax, tortuous, but yet unobstructed, and lead to false conclusions regarding the aetiology of the acute oliguric renal failure. Post-renal obstruction, however, usually produces some degree of loin tenderness, although such tenderness may at times be very slight in degree and difficult to elicit in a drowsy patient. The post-renal oliguria of idiopathic retroperitoneal fibrosis raises

diagnostic difficulties because, paradoxically, ureteric catheters may be freely passed up to the kidneys: however, the presence of intermittent oliguria or anuria, and the absence of calculi and prostatic or uterine malignancy, should suggest the diagnosis, particularly when there is elevation of the blood sedimentation rate. Surgical exploration may be required, not only to establish the diagnosis but also to effect treatment.

Intrinsic Renal Failure

Renal Oliguria

Renal oliguria may result from lesions of the renal arteries, veins, glomeruli, or tubules (Milne, 1957). The renal arteries may be occluded by a dissecting aneurysm of the aorta or by intimal stripping at aortography (Gaylis and Laws, 1956): the renal veins may thrombose in infants with gastro-intestinal disease (Regan and Crabtree, 1948) or in adults with amyloidosis which complicates chronic sepsis or a reticulosis. Glomerular lesions, rare in surgical patients, may be a reflection of glomerulonephritis or cortical necrosis.

Acute tubular necrosis is the commonest cause of acute oliguric intrinsic renal failure in surgical cases (and non-surgical cases, too) and may develop as a complication of (*a*) surgery or surgical conditions and (*b*) accidental trauma. Transfusion of incompatible blood has been incriminated as a cause (Barlas and Kolff, 1959), but the lesion almost always follows an episode of hypotension, the significance of which may be overlooked until the subsequent development of oliguric renal failure; indeed, relevant records of the blood-pressure during or shortly after surgical operations and in traumatic cases before the patient reaches hospital may not be available. Subsequent compensatory vasoconstriction with restitution of the blood-pressure may mislead the observer. Jaundiced patients, particularly when submitted to surgery under general anaesthesia (Shackman *et al.*, 1953), seem peculiarly susceptible to the effects of hypotension, and acute oliguric renal failure due to acute tubular necrosis may develop in circumstances which seldom produce such changes in non-jaundiced patients. The term "hepato-renal failure" is applied to this phenomenon.

The urine in acute tubular necrosis has a relatively low specific gravity, usually not greater than 1014, a urea concentration less than 1 g./100 ml., and a sodium concentration greater than 30 mEq/l.: albuminuria, with a moderate excess of white blood cells and a few hyaline casts, is usual. When the urine sodium concentration is less than 30 mEq/l., the renal lesion is more likely to be glomerular, and acute nephritis or cortical necrosis should be suspected.

Post-operative Oliguria

Le Quesne (1954) has drawn attention to the post-operative oliguria, associated with sodium retention, which may follow surgical operations. It is pre-renal in origin and, in the context of the present paper, has no special significance except that it may, on occasion, lead the observer to overlook the possibility that acute tubular necrosis or post-renal obstruction may, in fact, be really responsible for the oliguria. The urine specific gravity and sodium concentration partly resolves the issue: a high urine specific gravity (at least 1018) and a low sodium concentration (not greater than 30 mEq/l.) is indicative of a pre-renal post-operative oliguria but does not necessarily exclude an incomplete post-renal obstruction. Ureteric catheterization with retrograde pyelography may be required to establish the true diagnosis.

Since October, 1956, when an artificial kidney unit was established at Hammersmith Hospital, 106 surgical patients have been treated for acute renal failure. Most of the patients were transferred, at various stages of their illnesses, from other hospitals: some degree of artificial and unintentional case selection was thus inevitable. In the main, only severe cases and those likely to require dialysis were received.

During the same period, 123 "medical" patients and 48 "obstetric" patients with acute renal failure were admitted.

Aetiology of Pre-renal Extrinsic Renal Failure

Only four patients (Table I) with pre-renal extrinsic renal failure were seen (there is little doubt, however, that several more such cases occurred and were successfully treated at the parent hospitals during the period under review); pre-existing chronic renal insufficiency was present in three and post-operative pyloric obstruction was present in one. Fluid and electrolyte depletion followed acute intestinal obstruction in two of the patients (one referred to above and one other with abdominal adhesions and severe bilateral chronic pyelonephritis), rapid decompression by suprapubic cystostomy in one with chronic prostatic obstruction, and excessive vomiting in one with severe bilateral polycystic kidneys.

TABLE I.—*Cases of Pre-renal Extrinsic Renal Failure*

Case No.	Surgical Condition	Age and Sex	No. of Dialyses	Outcome
1	Suprapubic cystostomy with chronic prostatic obstruction	71 M	0	Survival
2	Intestinal obstruction; chronic pyelonephritis	38 F	0	,,
3	Polycystic kidneys	45 M	1	,,
4	Post-operative pyloric obstruction	46 M	1	Death

Case History

A medical practitioner aged 45 (Case 3) was able to conduct a busy general practice until a week before he was admitted to a hospital in Surrey with malaise, vomiting, and weakness. He realized that his general health had gradually deteriorated in the previous 12 months, and indeed he had suffered a transient attack of right hemiparesis, right homonymous hemianopia, and dysplexia during this time: a significant hypertension remained unexplained. He was transferred to Hammersmith Hospital in a stuporous state with the blood urea 415 mg./100 ml., serum potassium 3.8 mEq/l., and CO_2-combining power 10 mEq/l. It was soon clear that he had bilateral loin swellings, and these were shown by retrograde pyelography to be polycystic kidneys. A diagnosis of pre-renal extrinsic renal failure superimposed on chronic renal insufficiency was made and haemodialysis was carried out with dramatic clinical and biochemical improvement. He was subsequently able to ingest a 20-g. protein diet and sufficient fluids to produce a daily urine output of 3 l., with the result that the blood urea was sustained at 150 mg./100 ml. He was discharged to convalescence and was subsequently able to spend most of the summer on his boat off the south coast of England until he rapidly deteriorated again six months after haemodialysis. He found it increasingly difficult to drink large volumes and the urine output fell. The blood urea, which had been maintained between 120 and 150 mg./100 ml. during the summer, rose to 410 mg./100 ml. and the CO_2-combining power fell to 15 mEq/l. He was readmitted to Hammersmith Hospital and again successfully treated by

haemodialysis on the artificial kidney but died four days later from an antibiotic-resistant septicaemia. Post-mortem examination confirmed the diagnosis of severe bilateral polycystic kidneys and showed cerebral atherosclerosis with local infarction in the left parieto-occipital region.

Aetiology of Post-renal Extrinsic Renal Failure

There were 23 patients with post-renal obstructive extrinsic renal failure (Table II): obstruction was due to malignant disease in 11, calculi in four, retroperitoneal fibrosis in four, tuberculosis in two, and surgical complications in two. Of the 11 patients with malignant disease, four had carcinoma of the bladder, four carcinoma of the uterus, and three carcinoma of the prostate. The ureteric obstruction resulted from direct bilateral spread of the primary tumour in the pelvis in nine patients, metastatic spread into lymph nodes at the bifurcation of the iliac vessels in one patient with a solitary functioning kidney, and metastatic spread into para-aortic nodes with involvement of the proximal ureter of a solitary kidney in one.

TABLE II—*Cases of Post-renal Extrinsic Renal Failure*

Case No.	Surgical Condition	Age and Sex	Treatment	Outcome
5	Carcinoma of bladder ..	61 M	Laparotomy: no treatment	Death
6	,, ,, ,, ,,	74 M	Pyelostomy	Survival
7	,, ,, ,, ,,	71 M	Uretero-colic anastomosis	Death
8	,, ,, ,,	45 M	Nephrostomy	Survival
9	,, ,, cervix .	66 F	Uretero-colic anastomosis	Death
10	,, ,, ,, ..	54 F	Pyelostomy	Survival
11	,, ,, ,, ..	37 F	Uretero-colic anastomosis	,,
12	,, ,, ,, ..	72 F	,, ,,	Death
13	,, ,, prostate	73 M	Pyelostomy; oestrogens	Survival
14	,, ,, ,, ..	56 M	Oestrogens	,,
15	,, ,, ,, ..	59 M	,,	,,
16	Retroperitoneal fibrosis	67 M	Nephrostomy	,,
17	,, ,, ..	55 F	Ureterolysis	,,
18	,, ,, ..	50 F	Ureterostomy	,,
19	,, ,, ..	58 M	Nil	Death
20	Calculus anuria: solitary kidney	42 F	Ureterolithotomy	Survival
21	,, ,, ,,	59 F	,,	,,
22	Reflux anuria: ureteric calculus	68 M	,,	,,
23	Calculus stricture left ureter; atrophic right kidney	50 M	Nephrostomy	,,
24	Haemonephrosis; nephrolithotomy	24 M	,,	,,
25	Renal tuberculosis ..	17 M	Ureterostomy	,,
26	,, ,, ...	34 M	,,	Death
27	Ureteric ligation; total hysterectomy	61 F	Laparotomy. Anaesthetic death	,,

Of the four patients with calculous obstruction, two were known to have had previous nephrectomy, one had an aplastic contralateral kidney, and one, in whom subsequent excretion urograms showed good function on both sides, had reflex anuria after calculous impaction on one side.

Of the four patients with retroperitoneal fibrosis, two had idiopathic periureteric fibrosis (Stueber, 1959), one had fibrosis following organization of a retroperitoneal haematoma after aortic grafting, and one had fibrosis after total hysterectomy and pelvic irradiation.

Tuberculous stricture of the ureter of a solitary functioning kidney produced post-renal obstructive failure in two patients: tuberculostatic drug therapy had been employed in both cases and no doubt expedited the fibrotic process responsible for the obstruction.

Post-operative post-renal obstruction occurred in two patients: one had both ureters accidentally ligated at hysterectomy and one had an obstructive blood clot in the renal pelvis of a solitary kidney after nephrolithotomy.

A high proportion of our patients with post-renal obstructive renal failure were over the age of 55, and the primary cause was malignant disease: indeed, the onset of acute renal failure in elderly patients should suggest this possibility, though examples of acute nephritis, acute tubular necrosis, oligaemic pre-renal extrinsic renal failure, and non-malignant post-renal obstructive failure have been seen in patients in this age-group.

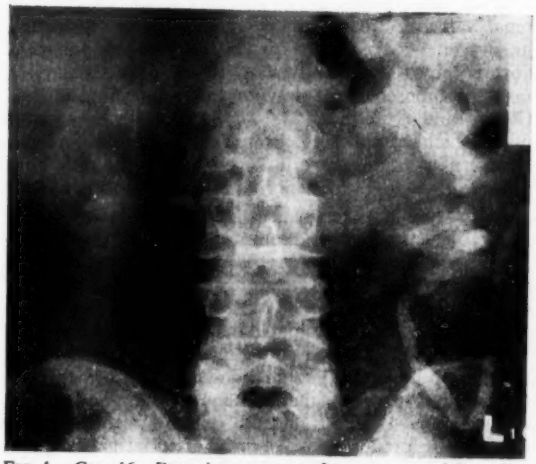


FIG. 1.—Case 16 Excretion urogram after emergency left nephrostomy for acute obstructive post-renal failure due to periureteritis fibrosa. Bilateral hydronephrosis is present and the nephrostomy tube can be seen.

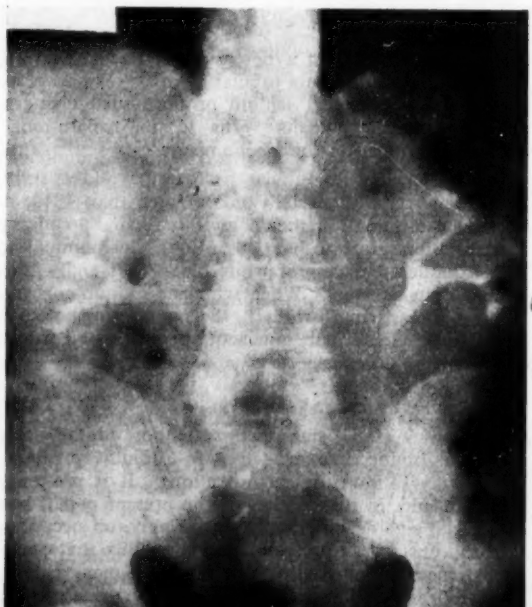


FIG. 2.—Case 16. Excretion urogram several months after bilateral ureterolysis. There is no trace now of the previous bilateral hydronephrosis.

Case History

A farmer aged 67 (Case 16) noticed a gradual onset of malaise, low back pain, and a tendency to constipation approximately eight months before admission to Hammersmith Hospital. Clinical examination elsewhere had shown no abnormality, and a barium-enema *x*-ray examination was reported to be normal. He was advised to take a long sea cruise, and while on his way home from South Africa he noticed a decrease in his daily urine output; finally, two days before admission he became virtually anuric.

On examination he was well nourished, drowsy, and a little pale. There was no loin tenderness, the bladder was not distended, and the prostate felt normal on rectal examination. The blood-pressure was 180/105, the blood urea 316 mg./100 ml., the serum potassium 7.6 mEq/l., the CO_2-combining power 15 mEq/l., the E.S.R. 100 mm., the haemoglobin 9.8 g., and the W.B.C. 7,000. He was treated by oral "resonium-A" and intravenous 40% dextrose with insulin. Ureteric catheterization was attempted but was unsuccessful: the catheters would not pass beyond 1 cm. Accordingly it was decided to explore the left kidney under general anaesthesia (this was an arbitrary decision, as loin tenderness and swelling were conspicuously absent). At operation the left kidney was found to be moderately enlarged and somewhat tense. A nephrostomy was carried out and the urine was found to have a specific gravity of 1025. Rapid restitution of the clinical and biochemical state paralleled a copious flow of urine from the nephrostomy, and after three weeks the blood urea had become 32 mg./100 ml., the serum potassium 3.8 mEq/l., and the CO_2-combining power 24 mEq/l.; the blood-pressure had fallen to 130/80. Excretion urography was then possible and showed bilateral hydronephrosis (Fig. 1). The cause of the hydronephrosis was obscure; there was no clinical, radiographic, or cystoscopic evidence of prostatic obstruction, and ureteric catheters could now be passed freely up to both kidneys. Accordingly the abdomen was explored through a long paramedian incision six weeks after the nephrostomy and both ureters were found to be embedded in dense retroperitoneal fibrosis; they were freed without great difficulty. It was not long before normal micturition was re-established and the nephrostomy wound closed spontaneously: indeed, he was discharged home three weeks after the exploration. Excretion urography carried out nine months later showed no abnormality (Fig. 2); the blood urea was 30 mg./100 ml., the E.S.R. was 3 mm., and the patient had regained his normal health.

Aetiology of Intrinsic Renal Failure

Intrinsic renal failure was present in 79 patients; it developed as a complication of (*a*) surgery or surgical conditions in 50 and (*b*) accidental trauma in 29. Acute tubular necrosis was present in 77 cases and cortical necrosis in two.

Surgery or Surgical Conditions

Of the 50 patients in this group (Table III), 28 had been subjected to elective surgery, 18 had been admitted to hospital as abdominal emergencies, two had been admitted with diabetic coma and developed pancreatitis as a complication (Trever and Cluff, 1958) one was

TABLE III.—*Extrarenal Conditions Responsible for the Onset of Acute Intrinsic Renal Failure*

Case No.	Surgical Condition	Operation	Age and Sex	No. of Dialyses	Outcome	Day of Death
28	Post-op. peritonitis; acute pancreatitis	Partial pancreatectomy	43 M	2	Death	23
29	" "	Cholecystectomy; exploration C.B.D.	61 F	4	"	22
30	" "	Partial pancreatectomy	63 M	0	"	9
31	Post-op. biliary peritonitis; acute pancreatitis	Exploration C.B.D.	50 M	0	"	11
32	Peritonitis; acute pancreatitis	Nil	66 F	0	"	13
33	" "	Laparotomy	52 M	0	"	99
34	" "	"	49 F	2	"	18
35	Peritonitis; acute pancreatitis; diabetic coma	Nil	19 F	0	"	12
36	" "	"	64 M	0	"	13
37	Post-op. peritonitis; acute pancreatitis	Emergency gastrectomy	44 M	0	"	5
38	Post-op. biliary peritonitis	Cholecystectomy	55 F	1	"	32
39	" "	"	58 M	3	Survival	
40	" "	Cholecystectomy; exploration C.B.D.	63 M	2	Death	17
41	" "	" "	65 F	2	"	24
42	Peritonitis; perforated diverticulitis coli	Colostomy and drainage	61 F	0	"	9
43	" "	" "	58 F	0	Survival	
44	Peritonitis; perforated colon	Retropubic prostatectomy	67 M	0	Death	5
45	Peritonitis; ulcerative colitis	Laparotomy and drainage	70 F	0	"	20
46	Post-op. peritonitis	Colostomy	42 F	0	"	11
47	Post-op. peritonitis; perforated diverticulitis	Closure of colostomy	57 M	1	"	8
48	Post-op. peritonitis	Gastro-enterostomy. Vagotomy	52 M	0	"	14
49	Peritonitis; P.G.U.	Suture of perforation	57 M	0	"	7
50	Post-op. peritonitis; haematemesis	Emergency gastrectomy	63 M	1	"	5
51	Peritonitis; acute appendicitis	Appendicectomy	28 M	0	"	15
52	Pelvic peritonitis: post-appendicectomy bleeding	"	19 F	0	Survival	
53	"	"	27 M	1	Death	18
54	Peritonitis	Total hysterectomy	37 F	2	"	12
55	Wound infection; renal tuberculosis	Nephrectomy	24 M	2	Death	21
56	Wound infection; renal calculus	Partial nephrectomy	49 M	1	"	35
57	Wound infection; peripheral vascular disease	Lumbar sympathectomy	50 M	2	Survival	
58	Septicaemia; peptic ulcer	Gastrectomy	45 M	0	Death	4
59	Pericarditis and pneumonia; Fallot's tetralogy	Repair ventricular septal defect	15 M	1	"	8
60	Ascending cholangitis; gall-stones	Nil	53 F	1	"	8
61	" "		64 F	1	"	25
62	Hypotension; haematemesis	Emergency gastrectomy	71 M	0	"	10
63	Hypotension; peptic ulcer	Gastrectomy	48 M	4	"	23
64	Hypotension; intrahepatic obstructive jaundice	Exploration C.B.D.	40 M	1	"	20
65	Hypotension; gall-stones	" "	64 F	0	"	7
66	Hypotension; thrombocytopenic purpura	Splenectomy	45 M	1	Survival	
67	Hypotension; urethral stone	Transurethral lithopaxy	53 M	2	Death	11
68	Hypotension	Excision of cervix	49 F	0	"	10
69	Hypotension; haematemesis and melaena; gastro-jejunal ulcer	Laparotomy	37 M	0	"	8
70	Hypotension; dissecting aneurysm	Transection and resuture aorta	37 M	1	"	9
71	Hypotension; ca. kidney	Nephrectomy	60 M	0	Survival	
72	Hypotension; benign prostatic hypertrophy	Transurethral resection prostate	63 M	0	"	
73	Hypotension; intimal stripping	Aortography	49 M	2	Death	20
74	Hypotension; cardiac arrest	Laparotomy	49 F	1	"	18
75	Total nephrectomy; horseshoe kidney		54 M	1	"	18
76	I.V.C. thrombosis; varicose veins	Bilateral stripping varicose veins	60 F	0	"	34
77	I.V.C. thrombosis; ca. kidney	Nephrectomy	62 M	0	Survival	

admitted with a dissecting aneurysm of the aorta, and one had been submitted to an aortography for investigation of vascular disease.

Peritonitis was present in 27 of the patients and was associated with pancreatitis in 10 of them; the pancreatitis followed pancreatic or biliary tract surgery in four, it presented primarily as an acute abdominal emergency in three, it complicated diabetic coma with acidosis in two, and followed an emergency gastrectomy for bleeding ulcer in one. The peritonitis was biliary in five instances (including one of the cases of post-operative pancreatitis); it complicated lesions of, or operations on, the large bowel in six instances (pre-operative three, post-operative three), the stomach and duodenum in four (pre-operative one, post-operative three), and the appendix in three (pre-operative one, post-operative two); it followed abdominal hysterectomy in one.

The acute intrinsic renal failure which occurred in the 27 patients with peritonitis was thought to have been due directly to the peritonitis in 25. In the remaining two the peritonitis was pelvic and followed infection of post-operative pelvic haematomata; significant hypotension occurred in both patients at the time of the bleeding, and the acute intrinsic renal failure clearly reflected this phenomenon.

Significant infection, other than peritonitis, was thought to be the cause of the acute intrinsic renal failure in seven patients: retroperitoneal cellulitis and wound infection with an antibiotic-resistant *Staph. aureus* occurred in three instances (lumbar nephrectomy two, lumbar sympathectomy one), calculous obstructive jaundice with cholangitis occurred in two (no surgery), a *Pseudomonas pyocyanea* septicaemia complicated an otherwise straightforward gastrectomy for benign ulcer in one, and an antibiotic-resistant *Staph. aureus* pericarditis and pneumonia occurred in one patient after a heart operation.

Although jaundice, of varying degrees, was present in 12 patients, and may have been contributory, in no instance was it considered to have been primarily responsible for the development of the acute intrinsic renal failure.

Case History

An American Marine colonel aged 40 (Case 64) developed jaundice while on active service in Europe and was submitted to laparotomy under general anaesthesia because the jaundice had persisted for six weeks and the biochemical tests and the liver biopsy strongly suggested obstructive jaundice. The biliary passages were explored, and, although there was no overt extrahepatic biliary obstruction, a T-tube was inserted into the common bile-duct for drainage. A prolonged hypotensive phase followed the operation and oliguria was noted. He was transferred to Hammersmith Hospital three days after the laparotomy and was found to be fully conscious, restless, and deeply jaundiced; the blood-pressure was 140/75, the blood urea 280 mg./100 ml., the serum potassium 6.6 mEq/l., the CO_2-combining power 12.4 mEq/l., and the serum bilirubin 16.5 mg./100 ml. He was given 40% dextrose with insulin and vitamins B and K through a caval catheter, and within two days began to void significant amounts of urine: on the ninth day after operation he voided 1.3 l. Despite diuresis, however, the blood urea continued to rise and reached 635 mg./100 ml. on the eleventh post-operative day: this was accompanied by epistaxis and melaena and led to a decision to carry out haemodialysis. This was successfully achieved and the blood urea was lowered to 180 mg./100 ml. The gastro-intestinal bleeding, however, persisted despite a normal prothrombin time (13 seconds) and transfusions of fresh blood. The urine output fell temporarily, as usual, after dialysis, but reached 0.75 l. on the sixth day after the dialysis (Fig. 3). However, the blood urea rose again to over 500 mg./100 ml. and he became comatose, dying 20 days after the original operation. Further dialysis was not undertaken because it was impossible to control the gastro-intestinal bleeding. Post-mortem examination showed intrahepatic biliary obstructive jaundice, acute tubular necrosis, and uraemic intestinal ulceration.

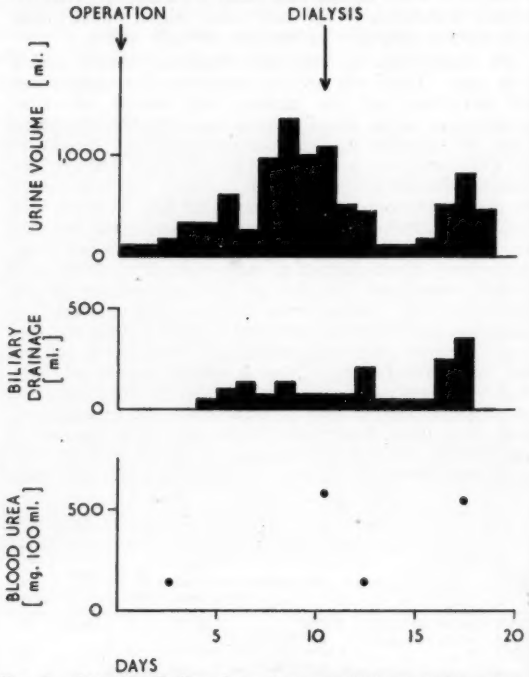


FIG. 3.—Case 64. Daily urine volumes and biliary drainage in a man aged 40 who developed acute tubular necrosis after surgical exploration and drainage of the biliary tract for obstructive jaundice. Haemodialysis was required on the 11th day after operation despite urine outputs of 1.7–1.3 l. The blood-urea values are shown. Uncontrollable gastro-intestinal bleeding precluded further dialysis, and death occurred 20 days after operation.

In 14 patients hypotension due to loss of blood or surgical shock was known to have occurred, and was thought to have been responsible for the development of the acute intrinsic renal failure. It complicated subtotal gastrectomy for benign peptic ulceration in two, exploration of the biliary tract for obstructive jaundice in two, post-appendicectomy intraperitoneal bleeding in two, splenectomy for thrombocytopenic purpura in one, nephrectomy for carcinoma in one, transurethral resection of the prostate in one, transurethral manipulation of an impacted posterior urethral calculus in one, perineal excision of the cervix in one, and cardiac arrest during laparotomy in one: it occurred pre-operatively in one patient who bled from a gastro-jejunal ulcer and in one who developed a dissecting aneurysm of the aorta.

Acute oliguric renal failure followed inferior venacava thrombosis in two patients (one after operative stripping of varicose veins and one after nephrectomy for carcinoma), total nephrectomy for carcinoma in a horseshoe kidney in one, and intimal stripping at aortography in one.

Accidental Trauma

There were 29 patients who sustained accidental trauma and developed acute intrinsic renal failure (Table IV). Road accidents accounted for 14, run-over

TABLE IV.—*Extrarenal Conditions Responsible for the Onset of Acute Intrinsic Renal Failure*

Case No.	Injuries	Cause	Age and Sex	No. of Dialyses	Outcome	Day of Death
78	Multiple fractures: pelvis, ribs, long bones. Visceral injuries: right kidney, liver	Road accident	30 M	2	Death	17
79	Multiple fractures: ribs, long bones. Visceral injuries: l. kidney, spleen	,,	20 M	1	,,	12
80	Multiple fractures: ribs, long bones. Visceral injuries: small bowel. Cerebral contusion	,,	59 M	0	,,	10
81	Multiple fractures: pelvis, long bones. Visceral injuries: r. kidney, spleen	,,	44 M	2	Survival	
82	Fractured pelvis	,,	35 M	0	,,	
83	Multiple fractures: pelvis, ribs	,,	16 M	2	,,	
84	Multiple fractures: skull, long bones	,,	27 M	2	Death	11
85	Multiple fractures: pelvis, long bones	,,	63 M	0	,,	6
86	Fractured pelvis: extraperitoneal rupture of bladder	,,	4 M	0	Survival	
87	Ruptured solitary kidney	,,	18 M	0	Death	10
88	Fractured ribs. Visceral injuries: liver, spleen, stomach	,,	21 M	2	,,	9
89	Fractured spine. Ruptured left kidney	,,	50 F	2	,,	17
90	Fractured pelvis: rupture of posterior urethra	,,	54 M	2	,,	20
91	Multiple fractures: long bones	,,	17 M	0	Survival	
92	Multiple fractures: traumatic amputation arm and leg. Intracranial haemorrhage	Run-over accident	52 M	1	Death	7
93	Multiple fractures: pelvis, long bones	,,	37 M	1	,,	12
94	Traumatic amputation leg	,,	60 M	0	Survival	
95	Fractured pelvis: extraperitoneal rupture of bladder	,,	55 M	0	Death	8
96	Multiple visceral injuries: left kidney, liver, pancreas, stomach	G.S.W.	20 M	2	,,	16
97	Lacerated small bowel and I.V.C.	,,	21 M	0	,,	6
98	Lacerated liver	,,	27 M	0	,,	17
99	Multiple visceral injuries: right kidney, liver, transverse colon	,,	18 M	0	,,	7
100	Extensive burns		20 M	2	,,	9
101	,, ,, ...		42 M	1	,,	5
102	Fractured spine	Fall	23 M	1	,,	18
103	Fractured pelvis; extraperitoneal rupture of bladder	,,	36 M	4	,,	20
104	Muscle necrosis; coal-gas poisoning	Domestic accident	23 F	0	,,	9
105	Muscle necrosis; dislocated shoulder	,,	54 M	0	,,	6
106	Multiple fractures: long bones	Pit accident	40 M	1	Survival	

accidents (train, tractor, mobile crane) for four, gunshot wounds for four, extensive burns for two, falls from heights for two, domestic accidents (muscle necrosis after a fall down stairs and complicating dislocation of a shoulder in a recluse, and muscle necrosis complicating coal-gas poisoning in a young woman (Loughridge *et al.*, 1958), for two, and a pit accident for one.

Abdominal visceral injuries (excluding bladder injuries) were present in 11 patients, multiple fractures without visceral injury in eight, pelvic fractures with rupture of the posterior urethra or extraperitoneal rupture of the bladder in four, extensive muscle necrosis in two, and extensive surface burns in two.

Of the 11 patients with abdominal visceral injuries, there were six with multiple visceral injuries and five with concomitant fractures of ribs, pelvis, or long bones. A ruptured kidney was present in seven instances, the liver was ruptured in five, the spleen in three, the pancreas in one, the stomach in two, the small bowel in two, the large bowel in one, and the inferior vena cava in one. Laparotomy was successfully carried out under general anaesthesia in 10 of the 11 patients and there is little to suggest, in retrospect, that it contributed significantly to the development of acute intrinsic renal failure: indeed, there is good reason to believe that prolonged hypotension immediately after the injury was adequate alone to explain the subsequent course of events.

CASE HISTORY

An American non-commissioned officer aged 44 (Case 81) was involved in a road accident while on active service in Europe. He sustained a comminuted fracture of the upper third of the right femur, an open fracture of the right elbow, a fractured pelvis, multiple skin lacerations, a rupture of the spleen and a rupture of the right kidney. Laparotomy under general anaesthesia was carried out within a few hours; the spleen was removed and the right kidney sutured; the fractures were treated and immobilized in plaster-of-Paris. He was given 5 l. of blood. Post-operative oliguria was noted and he was transferred to Hammersmith

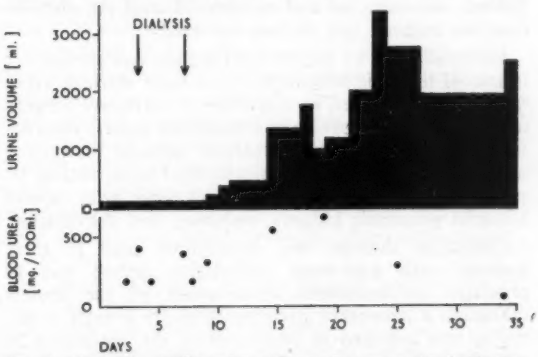


FIG. 4.—Case 81. Daily urine volumes in a man aged 44 who developed acute tubular necrosis after multiple injuries sustained in a road accident. Haemodialysis was required on two occasions before the onset of spontaneous diuresis on the 11th day and subsequent recovery. The blood-urea values are shown.

Hospital two days after his accident, when the blood urea was found to be 170 mg./100 ml., the serum potassium 5 mEq/l., and the CO_2-combining power 20 mEq/l. The blood-pressure was 160/90. A caval catheter was inserted and he was given 40% dextrose with insulin and vitamin B, but, because there was a rapid rise of blood urea, haemodialysis was required on the fourth day after the accident (Fig. 4). A second dialysis was required four days later, and, although a third dialysis was contemplated, spontaneous diuresis began 11 days after the accident, and, despite the fact that the blood urea continued to climb and reached 650 mg./100 ml., restitution gradually ensued. A spontaneous leak of urine occurred from the right loin, and this, together with the hip spica plaster cast required for the treatment of the femoral and pelvic fractures, made nursing extremely difficult and, not surprisingly, he developed a sizable pressure sore over the sacrum. He was finally transferred back to the United States Military Hospital approximately 10 weeks after the initial accident. He was then ambulatory and clinically well, and his blood urea was 30 mg./100 ml. There was, however, a large staghorn calculus in the right kidney which had developed while under treatment and for which subsequent surgery was required.

Prolonged hypotension, a direct result of injury (Clarke, 1957), was thought to have been responsible for the development of acute intrinsic renal failure in the eight patients with multiple fractures without visceral injury, the four patients with pelvic fractures and rupture of the posterior urethra or extraperitoneal rupture of the bladder, and the two patients with extensive burns; myoglobin (Bywaters and Dible, 1942)

liberated from damaged muscles may have been contributory in the two patients with muscle necrosis.

Treatment of Extrinsic Renal Failure

No useful purpose would be served by recording a detailed acount of the treatment, by blood transfusion, water and electrolyte replacement, used in the four patients with pre-renal extrinsic renal failure and the 23 patients with post-renal obstructive failure: it varied from case to case, although it was always based on regular clinical, biochemical, and haematological observations. The patients were seen at least once a day and repeated, usually daily, biochemical observations were made not only on the blood but also on the urine and, when required, on gastro-intestinal aspirate. When post-renal obstruction was present, fluid and electrolyte restriction, as used for the treatment of patients in the oliguric phase of acute intrinsic renal failure, was instituted and maintained until the obstruction was relieved and diuresis occurred.

Haemodialysis by the artificial kidney was carried out in two of the four patients with pre-renal extrinsic renal failure: it was used as a prelude to corrective surgery in one patient with severe post-operative pyloric obstruction and hypokalaemic alkalosis because it proved impossible to correct the biochemical abnormality by potassium administration, and in one with severe bilateral polycystic kidneys, vomiting, and dehydration.

Oestrogen therapy was successfully used in three patients with post-renal obstructive failure due to prostatic carcinomatous involvement of the ureters (although a temporary pyelostomy under general anaesthesia was required in one); 19 of the remaining 20 patients with post-renal obstruction due to causes other than prostatic malignancy were submitted to surgery, under general anaesthesia in 14 instances, spinal anaesthesia in four, and local anaesthesia in one (one patient with retroperitoneal fibrosis due to a leaking aortic graft was considered unsuitable for surgery). Nephrostomy was carried out in four patients, uretero-colic transplantation in four, pyelostomy in three (including one of the patients with prostatic cancer treated by oestrogens), ureterostomy in three, uretero-lithotomy in three, and ureterolysis in one; definitive surgery was not possible in one patient with bladder cancer, and cardiac arrest occurred in one other during operation under general anaesthesia.

After relief of the post-renal obstruction, the daily urine volumes, together with the sodium and potassium contents, were carefully determined so that comparable replacement of water and electrolytes, together with a basal daily requirement of 500 ml. of water, could be given, orally when possible, during the succeeding day.

Treatment of Intrinsic Renal Failure

Oliguric Phase

Excepting eight cases in which it was possible to use the oral route—and here 20% lactose in water is preferable—the primary treatment of the acute intrinsic renal failure was based on the administration of 40% dextrose in water containing insulin (1 unit per 10 g. of dextrose), 10 ml. of 20% calcium gluconate, and a vitamin B compound through a caval catheter; 45 of the 50 "post-surgical" and 26 of the 29 "post-traumatic" cases were treated in this way. The daily allowance was determined by the sum of the basal daily requirement (500 ml. in a 70 kg. patient) and volumes equal to any urine, gastro-intestinal aspirate, vomit, loss from fistulae or diarrhoea; it was sometimes expedient to weigh dressings and the stools. Extrarenal losses of potassium from the gastro-intestinal tract were often significant. Ion-exchange resin (resonium-A, 15 g. four-hourly) for hyperkalaemia was required in less than half the cases; when ileus was present, a watery solution of the resin was administered through an indwelling gastric catheter and was aspirated one hour later. Only rarely was sodium lactate (M/3 or M/6) given as a temporary measure to control acidosis and decrease the serum potassium.

Haemodialysis by the artificial kidney was carried out in 25 of the 50 "post-surgical" and 16 of the 29 "post-traumatic" cases. Multiple dialyses were required in 22: on two occasions in nine "post-surgical" and nine "post-traumatic" cases, on three occasions in one "post-surgical" case, and on four occasions in two "post-surgical" and one "post-traumatic" case. Early dialysis was often required; it was carried out on the fourth day of oliguria in eight patients (two "post-surgical" and six "post-traumatic") and was required before the lapse of one week in 26 (14 "post-surgical" and 12 "post-traumatic").

Urgent transfusions of whole blood were sometimes required to correct oligaemic hypotension. Anaemia, when the haemoglobin concentration was less than 11 g./100 ml., was treated by transfusions of packed cells, which, when delay was justified, were preferably given during dialysis. Surgical treatment was carried out during the oliguric phase in 17 instances.

Diuretic Phase

With the onset of diuresis, which was generally characterized by a rapid improvement in the clinical state, the fluid replacement was increased to balance the urine output, and when significant losses of sodium and potassium were observed comparable replacement was instituted. The caval catheter was withdrawn as soon as possible, and a 20-g. protein diet was given when the blood urea showed a sustained fall and reached 150 mg./100 ml.

Major surgical treatment was carried out during the diuretic phase in seven instances.

Results in Extrinsic Renal Failure

Of the four patients with pre-renal extrinsic renal failure, one recovered and underwent a successful second-stage prostatectomy a year after the acute episode, two others (one with severe bilateral chronic pyelonephritis and one with severe bilateral polycystic kidneys) recovered immediately but died within six months, and one died from pulmonary complications a few days after an emergency gastro-enterostomy for post-operative pyloric obstruction. The series is too small to justify broad conclusions, and, moreover, three of the four patients had significant chronic renal disease.

Of the 23 patients with post-renal obstructive failure immediate success was achieved in 16, by surgery in 14 and by administration of oestrogens in two. No definitive surgery was possible in three others (one died during general anaesthesia, one had an extensive infiltrating bladder cancer, and one had an extensive retroperitoneal fibrosis after a leaking aortic graft). There were three deaths from peritonitis after uretero-colic anastomosis in patients with uterine cancer, and one from persistent renal failure after ureterostomy in a patient with tuberculous ureteric stenosis of a solitary

functioning kidney. Recovery occurred in four patients treated by nephrostomy, three by pyelostomy, three by ureterolithotomy, two by ureterostomy, one by ureterolysis, and one by uretero-colic anastomosis.

Results in Intrinsic Renal Failure

Surgery or Surgical Conditions

Only 8 of the 50 patients who developed acute intrinsic renal failure after surgery or surgical conditions survived to leave hospital. Of the 42 fatal cases, however, death occurred in 28 patients with blood-urea values less than 450 mg./100 ml., serum potassium values less than 6.5 mEq/l., and serum bicarbonate values greater than 14 mEq/l.—values which would not necessarily be expected to prove lethal but which, in the presence of significant and often multiple extrarenal lesions, adversely affected the prognosis. Serious chest complications, pneumonia or purulent tracheobronchitis, occurred in 18 instances, peritonitis in 13, septicaemia in 11, and septic pericarditis in three; severe gastro-intestinal bleeding developed in two patients, a haemothorax in one, and a cerebral haemorrhage in one.

Of 14 patients who were considered to have died of renal failure, there were only four without significant extrarenal complications: in the remaining 10, pneumonia or purulent tracheobronchitis was present in 10 instances, severe gastro-intestinal bleeding in four, peritonitis in three, septicaemia in three, suppurative cholangitis in one, and intracranial bleeding in one.

Of the eight survivors, significant extrarenal complications occurred in six.

Accidental Trauma

Only 7 of the 29 patients with post-traumatic acute intrinsic renal failure survived to leave hospital: one of the seven died a year later from chronic nephritis, which was first recognized during the recovery phase of the superadded acute tubular necrosis.

Of the 22 fatal cases, 14 deaths occurred in patients with non-lethal values of blood urea, serum potassium, and serum bicarbonate although it is not denied that the renal factors contributed to the mortality. Serious chest complications, pneumonia or purulent tracheobronchitis, occurred in 10 instances, pericardial effusions in four, cerebral haemorrhage in two, retroperitoneal haemorrhage in two, peritonitis in one, septicaemia in one, gastro-pleural fistula in one, gas-gangrene in one, cerebral, renal, and pulmonary fat embolism in one, and cerebral oedema in one; anaesthetic deaths occurred in two instances.

Extrarenal complications were relatively few in the eight patients who were considered to have died of renal failure: serious chest complications occurred in three instances, peritonitis in two, and retroperitoneal haemorrhage in one.

Of the seven survivors, only two had significant extrarenal complications.

Discussion

The incidence in civilian practice of acute oliguric renal failure, a serious complication of surgery and surgical conditions, is difficult to assess: it is probably low. Most of the patients collated in the present series were transferred from a comparatively large number of widely separated hospitals, and, although approximately 25 such patients were received each year (a similar number of non-surgical cases of acute renal failure were also admitted), it is not unreasonable to conclude that these represented only a small fraction of the total number of surgical cases seen and treated at the various hospitals during the period under review. An unknown number of less severe cases of acute renal failure may have been successfully managed by "conservative" methods alone at the parent hospitals and did not require the special facilities available in an artificial kidney unit: it is not possible to estimate their number. The fact that only four cases of pre-renal extrinsic renal failure were received suggests that such was probably the case, for patients with uncomplicated pre-renal extrinsic renal failure are easily managed by simple and readily available measures: haemodialysis is seldom required, although it was used in two of the four such patients we received.

Similarly, haemodialysis is seldom required for the treatment of patients with post-renal extrinsic renal failure; indeed, it was not used in the management of the 23 patients in the present series. The mechanical obstruction responsible for the post-renal failure was relieved by surgical measures in the majority of cases; general anaesthesia was used when there was no electrocardiographic evidence of hyperkalaemia, although spinal or local anaesthesia was sometimes preferred. When surgical relief of the post-renal obstruction was followed by a significant diuresis a regime of balanced water and electrolyte replacement was instituted.

The majority (74%) of the surgical patients with acute renal failure had acute intrinsic renal failure, which, with the exception of two hypertensives who died and were shown to have had patchy cortical necrosis, had resulted from acute tubular necrosis. It developed as a complication of surgery or surgical conditions in 47% and followed accidental trauma in 27%. Hypotension, sometimes not recorded, was regarded as the predisposing cause in all cases: mismatched transfusions were conspicuously absent.

Uncomplicated acute intrinsic renal failure in non-surgical patients has a relatively good prognosis: Parsons and McCracken (1959) and Loughridge *et al.* (1960) record a recovery rate of approximately 80%. In contrast, the prognosis is far worse in surgical patients. The recovery rate in the present series was only approximately 20%, and, although somewhat better results have been recorded by others (Smith *et al.*, 1955; Bluemle *et al.*, 1959; Parsons and McCracken, 1959), the differences may not be significant, because there are variations in the nature and degree of severity of the primary surgical conditions, and it cannot be assumed that the ensuing extrarenal complications were comparable in each series of cases. Furthermore, it is not certain that fatalities due to the primary surgical conditions or extrarenal complications were always included in the mortality figures. The high mortality in the present series includes two patients who had been subjected to total nephrectomy and in whom death was inevitable, and 42 who died with significant, but not necessarily lethal, values of blood urea, serum potassium, and serum bicarbonate; in other words, more than half the patients succumbed with, but not from, acute renal failure.

As has been noted by others (Bluemle *et al.*, 1959), we found infection to be the commonest significant complication: it developed in 77% of our patients with acute intrinsic renal failure. Septicaemia, peritonitis,

wound infection, and infection in the urinary tract all occurred with varying frequency: chest infection, either pneumonia or severe purulent tracheobronchitis, was the most frequent and lethal form. Gastro-intestinal and intracranial bleeding, wound dehiscence, and bedsores were also seen.

The fact that haemodialysis was required in 41 of the 79 patients with acute intrinsic renal failure, and that multiple dialyses were carried out in 22 of the 41, more than suggests that there was a high and sustained metabolic response to the surgical and accidental trauma and infection, and that there was rapid biochemical deterioration; indeed, the difference between the metabolic response of surgical and non-surgical patients with acute renal failure is striking (Milne, *et al.*, 1960). The presence of wounds, devitalized tissue, and extravasated blood, apart from the direct effect they produce on biochemical deterioration, provide a portal of entry and a suitable medium for infection which not only provokes an increased metabolic response but also adds directly to the morbidity and mortality.

There is no evidence to suggest that there is any qualitative difference between the renal lesions in surgical and non-surgical cases of acute intrinsic renal failure. There is also, unfortunately, little doubt that a higher mortality rate is inevitable in the surgical patients. While complications of surgery and accidental trauma aggravate the renal aspect of the problem the uraemic state itself encourages their development. The presence of an indwelling gastric tube and mouth-breathing encourage chest infection; prolonged intravenous therapy and poor wound-healing invite bacterial contamination; prolonged recumbency and drowsiness, together with incontinence or an intestinal fistula, encourage the development of pressure sores; and an indwelling urethral catheter is inevitably followed by urethritis, cystitis, and sometimes pyelonephritis: all aggravate the uraemic state. There is, therefore, a dilemma. Surgical patients with acute intrinsic renal failure are peculiarly liable to develop complications which aggravate and are aggravated by the uraemic state. It is to be hoped that the dilemma will be resolved, but this is not likely unless there is a fresh approach to the problem. Haemodialysis effectively controls the biochemical abonormalities of acute oliguric renal failure of surgical origin, but the control is only temporary. Continuous haemodialysis may have more to offer in such cases. Infection, the major hazard, is unlikely to be contained until properly designed isolation facilities with air-conditioned single rooms and separate toilet accommodation are available, and there is an adequate supply of trained nursing staff for duty not only during the day but also during the night. Successful homotransplantation of a kidney might well resolve the problem.

Summary

Acute extrinsic oliguric renal failure (which includes pre-renal and post-renal obstructive oliguria) and acute intrinsic oliguric renal failure may complicate surgical and traumatic conditions.

Experience gained from the management of 106 such cases is presented: extrinsic renal failure was present in 27 (4 pre-renal and 23 post-renal) and intrinsic failure in 79.

Intrinsic renal failure was due to acute tubular necrosis in 77 cases and cortical necrosis in 2; it complicated surgery or surgical conditions in 50 and followed accidental trauma in 29.

The majority of the patients had been transferred at various stages of their illness, and were severe cases likely to require treatment by an artificial kidney. This probably explains the apparent low incidence of pre-renal extrinsic failure.

Post-renal obstruction was a complication of pelvic malignant disease, urinary calculi, retroperitoneal fibrosis, urological tuberculosis, and surgical operations. Treatment by surgery, and oestrogens in cases of prostatic cancer, was successful in 15 of 24 such cases. Haemodialysis was not required.

Of 50 patients with acute intrinsic renal failure following surgery or surgical conditions, the predisposing cause was peritonitis in 25, hypotension in 14, and infection (other than peritonitis) in 7. Renal-vein thrombosis, total nephrectomy, and intimal stripping at aortography accounted for the other four cases. Haemodialysis, often multiple, was required in 25 of the 50 patients.

Hypotension was responsible for the acute intrinsic renal failure in the 29 post-traumatic cases. Road and vehicular accidents occurred in 18. Haemodialysis, usually multiple, was required in 16 of the 29 patients.

Success was achieved in only 34 of the 106 patients. The survival rate in the cases of acute intrinsic renal failure was only approximately 20%, but a high proportion of the fatalities occurred in patients with non-lethal biochemical abnormalities: extrarenal lesions contributed significantly to the high mortality. Infection was the most serious hazard; serious complications included gas-gangrene, multiple fat embolism, gastro-intestinal and intracranial haemorrhage.

References

Aird, I. (1957). *A Companion in Surgical Studies*, 2nd ed. Livingstone, Edinburgh.
Aoyama, S., and Kolff, W. J. (1957). *Amer. J. Med.*, **23**, 565.
Balch, H. H., Meroney, W. H., and Sako, Y. (1955). *Surg. Gynec. Obstet.*, **100**, 439.
Barlas, G. M., and Kolff, W. J. (1959). *J. Amer. med. Ass.*, **169**, 1969.
Bluemle, L. W., jun., Webster, G. D., jun., and Elkinton, J. R. (1959). *A.M.A. Arch. intern. Med.*, **104**, 180.
Borst, J. G. G. (1948). *Lancet*, **1**, 824.
Bull, G. M., Joekes, A. M., and Lowe, K. G. (1949). Ibid., **2**, 229.
Bywaters, E. G. L., and Dible, J. H. (1942). *J. Path. Bact.*, **54**, 111.
Clarke, A. R. (1957). *Brit. med. J.*, **2**, 721.
Evans, B. M., Hughes-Jones, N. C., Milne, M.D., and Yellowlees, H. (1953). *Lancet*, **2**, 791.
Gaylis, H., and Laws, J. W. (1956). Ibid., **2**, 1141.
Hamburger, J., Richet, G., Funck-Brentano, J. L., Ducrot, H., Antoine, B., and Crosnier, J. (1958). *Rev. méd. Liège*, **13**, 74.
Legrain, M. (1951). *Néphrites Aigües Anuriques*. Doin, Paris.
Le Quesne, L. P. (1954). *Fluid Balance in Surgical Practice*. Lloyd-Luke, London.
Loughridge, L. W., Leader, L. P., and Bowen, D. A. L. (1958). *Lancet*, **2**, 349.
—— Milne, M. D., Shackman, R., and Wootton, I. D. P. (1960). Ibid., **1**, 351.
Meroney, W. H., and Herndon, R. F. (1954). *J. Amer. med. Ass.*, **155**, 877.
Milne, M. D. (1957). *Proc. roy. Soc. Med.*, **50**, 493.
—— Shackman, R., Struthers, N. W., and Loughridge, L. W. (1960). To be published.
Parsons, F. M., and McCracken, B. H. (1959). *Brit. med. J.*, **1**, 740.
Regan, F. C., and Crabtree, E. G. (1948). *J. Urol. (Baltimore)*, **59**, 981.
Salisbury, P. F. (1958). *A.M.A. Arch. intern. Med.*, **101**, 690.
Shackman, R., Graber, I. G., and Melrose, D. G. (1953). *Clin. Sci.*, **12**, 307.
Smith, L. H., jun., Post, R. S., Teschan, P. E., Abernathy, R. S., Davis, J. H., Gray, D. M., Howard, J. M., Johnson, K. E., Klopp, E., Mundy, R. L., O'Meara, M. P., and Rush, B. F., jun. (1955). *Amer. J. Med.*, **18**, 187.
Stueber, P. J., jun. (1959). *J. Urol. (Baltimore)*, **82**, 41.
Swann, R. C., and Merrill, J. P. (1953). Ibid., **32**, 215.
Trever, R. W., and Cluff, L. E. (1958). *Amer. J. Med.*, **24**, 368.
Waugh, W. H. (1959). *A.M.A. Arch. intern. Med.*, **103**, 686.

FATE OF 424 PATIENTS WITH PNEUMONIA AND BRONCHITIS

BY

JOHN FRY, M.D., F.R.C.S.
General Practitioner, Beckenham, Kent

Each year about one million persons in Great Britain suffer from an acute chest infection (College of General Practitioners, 1956). Who are these people, and what eventually happens to them? How many recover completely, and how many remain permanently disabled? On these very pertinent and important questions we have relatively little information.

An attempt to answer these questions is made in this survey and review of 424 patients in a general practice who suffered from pneumonia or acute bronchitis during 1949–54. In 1959, 5 to 10 years later, an assessment was made of the situation in respect of their health in general and their respiratory function in particular.

Methods

In general practice a long-term follow-up presents no serious difficulties, because the doctor is working constantly in the static community of his own practice and is able to see the great majority of his patients (or their relatives) at least once a year and can keep in close contact with all that goes on. There is bound to be a loss of patients owing to removal, and 38 of those with an acute chest infection who were seen during the period of observation subsequently moved out of the practice. The remaining 424 patients, who were followed up until 1959 (or until they died), represent 92% of the possible total.

The methods employed were simple yet effective. A card index was kept of all the patients in the practice who suffered from acute bronchitis or pneumonia during 1949–54. In addition to clinical details, a record was made of the past history, smoking habits, and social class. These patients were followed up, notes being kept of any further incidents; and in 1959 all the survivors still in the practice were seen for any residual disabilities.

Patients were regarded as suffering from pneumonia or acute bronchitis when the following three criteria were present: a sudden *onset* or a sudden worsening of an established chronic respiratory condition; a *fever* of over 100° F. (37.8° C.) on at least one occasion during the illness; and *abnormal physical signs* in the chest on clinical examination. All cases coming within this definition were included—both sexes, of all ages, and those with and without previous chest troubles.

There is no readily acceptable nomenclature for these conditions, but that used was as follows:

Lobar pneumonia was diagnosed when there were definite physical signs of consolidation in the chest—that is, dullness and bronchial breathing.

Segmental pneumonia was diagnosed when the abnormal physical signs consisted of a local area of moist sounds on one side of the chest.

Acute bronchitis (or bronchopneumonia) was diagnosed when the physical signs in the chest (wheezes and moist sounds) were diffuse and bilateral.

Although 315 of the 424 patients were examined radiologically, the findings were not taken into account in the analysis, as this study was intended to be a clinical one in a general practice.

Classification of *social class* was based on the occupation of the wage-earner in the household, either the patient or the husband or father.

Smoking habits were simply classified. A "smoker" was considered to be any person who had smoked more than five cigarettes daily and regularly for more than one year at any time during his or her life. No distinction was made between the actual amounts being smoked or whether the person was an "ex-smoker." Only adults over the age of 15 were asked about their smoking habits, and the results expressed are percentages of those over this age.

The *grading* of patients was based on an assessment of function and on the degree of residual symptoms. Five grades were recognized:

1. No respiratory illness or symptoms requiring medical attention since the recorded episode.

2. No residual respiratory symptoms, but there was a record of attendance for a minor respiratory illness during the follow-up period.

3. *Some persistent residual symptoms*—that is, cough and sputum for at least four weeks in any year. No major interference with daily routine and little time lost from school or work on account of respiratory illnesses during the follow-up period.

4. *Serious After-effects.*—Residual symptoms—that is, cough, sputum, and dyspnoea present for most of the time. Considerable interference with normal routine—that is, more than four weeks away from work or school in any year.

5. *Complete Invalids.*—Severe residual symptoms. Unable to do any work at home or at usual occupation. *Deaths* were included in this grade.

Disability was considered to be present in grades 3, 4, and 5. This "grading" was applied to the functional state of the patients both *before* the chest infection under consideration and also to the situation *after* the follow-up period. In this way it was possible to assess the degree of deterioration that might have occurred.

The Practice

The basic information on this practice in a south-eastern suburb of London is shown in Tables I and II.

TABLE I.—*Population at Risk in* 1952*

Age:	0–	10–	20–	30–	40–	50–	60–	70+	Total
Males	410	221	308	409	389	298	189	95	2,319
Females	347	227	379	411	375	273	196	146	2,354
Total	757	448	687	820	764	571	385	241	4,673

* 1952 was taken to represent the average for the whole period.

TABLE II.—*Social Class Distribution of the Practice*

	Social Class					Students and Not Known	Total
	I	II	III	IV	V		
No. ..	225	1,036	2,744	223	272	173	4,673
% ..	5	23	61	5	6	—	100

The smoking habits of the practice adult population were not worked out, but reliance has been placed on figures collected by Todd (1959), who states that, in London in 1956, 76% of all men were smokers and 48% of all women (these rates being applied to subjects aged 15 and over).

Results in the Series as a Whole

Incidence.—Over the observation period (1949–54) 462 individual patients suffered 553 episodes of pneumonia or acute bronchitis. Eventually 424 were

followed up and reviewed 5 to 10 years later. The annual incidence in this practice was therefore approximately 20 per 1,000.

Age and Sex.—The distribution of patients who suffered from pneumonia or acute bronchitis at various ages is shown in Table III.

TABLE III.—*Age Incidence of Acute Chest Infections* (1949-54)

Age:	0–	10–	20–	30–	40–	50–	60–	70+	Total
Males ..	84	8	10	13	24	41	26	26	232
Females	54	4	9	16	32	23	25	29	192
Total	138	12	19	29	56	64	51	55	424
‰	180	30	29	40	73	102	132	271	92

It is evident that acute chest infections predominantly tend to affect the young and the old. There were no striking sex differences.

Recurrences.—During the period of observation no fewer than 44% (188) of these patients had a recurrence of their acute chest infection. Nearly twice as many males (120) as females (68) had a recurrence. The liability to recurrent attacks also varied with age, and Table IV shows the proportion of the patients in each age-group who suffered a recurrence.

TABLE IV.—*Recurrences at Various Ages Expressed as Percentage of Those in Each Age-group*

	0–	10–	20–	30–	40–	50–	60–	70+	Total
Males ..	62	22	10	13	33	53	61	73	52%
Females	38	20	20	26	40	31	48	31	35%

It is interesting to note that the excessive liability of males to suffer recurrent attacks was apparent only in boys under 10 and in men over 50.

Functional Grading.—Grades 3, 4, and 5 were taken as evidence of disability. The functional grading of the patients before and after their chest infections are shown in Table V.

TABLE V.—*Grades Before and After Acute Chest Infection*

Grade	Before		After	
1	262	62%	120	28%
2	70	17%	124	29%
3	80	19%	125	30%
4	11	2% } 21%	17	4% } 43%
5	1	—	38	9%
Total ..	424	100%	424	100%

It is evident that twice as many patients were disabled at follow-up than had been before suffering infection. While the infection itself must have contributed to this deterioration, other possible factors, such as age, chronic bronchitis, atmospheric pollution, and smoking habits must also be considered.

During the period of observation, 24 of these patients died from the effects of their chest infection.

Social Classes.—Compared with the social grouping in the practice as a whole there was a greater tendency for those in the lower social classes (IV and V) to suffer from these acute chest infections (Table VI).

TABLE VI.—*Social Class Distribution (Percentages)*

Social Class:	I	II	III	IV	V	Total
Acute chest infections ..	3	6	49	32	10	100
Practice as a whole	5	23	61	5	6	100

Smoking Habits.—The proportion of smokers and non-smokers in the group of adult patients did not vary greatly from the figures for the area as a whole. Thus, while there were more male smokers in the group with chest infections, there were relatively fewer female smokers in those affected (Table VII).

TABLE VII.—*Percentages of Smokers among Those with Acute Chest Infections and the General Population (Expressed as Rates of Population at Risk Aged 15 and Over)*

	Male		Female	
	Chest Infections	Population	Chest Infections	Population
Smokers	83%	76%	31%	48%
Non-smokers ..	17%	24%	69%	52%

Previous History of Chest Illness.—182 (43%) persons (125 males, 57 females) had a past history of chest illness.

Clinical Groups.—The proportions of the various clinical groups in the series were as follows:

	No.	%
Lobar pneumonia	72	15
Segmental ,, ...	192	41
Acute bronchitis	200	43
Others	5	1
	469*	100

* Some patients suffered from more than one type during the period of observation.

The fate of the patients in each of these groups is shown below.

Lobar Pneumonia

There were 72 patients (34 males, 38 females) with lobar pneumonia, or 15% of the total. The age incidence (Table VIII) showed a rise with age.

TABLE VIII.—*Age Incidence of Lobar Pneumonia*

Age:	0–	10–	20–	30–	40–	50–	60–	70+	Total
Males ..	—	2	2	4	1	14	3	8	34
Females	3	1	4	2	8	6	7	7	38
Total	3	3	6	6	9	20	10	15	72
‰ ..	4	7	8	7	11	35	26	62	15

The social class distribution (Table IX) showed that there was an increased tendency for the lower groups to suffer from lobar pneumonia.

TABLE IX.—*Social Class Distribution in Lobar Pneumonia*

Social Class:	I	II	III	IV	V
Lobar pneumonia ..	3	9	56	26	6
Practice	5	23	61	5	6

Investigation of the smoking habits of patients with lobar pneumonia showed that 90% of men were smokers and only 25% of women, compared with approximate figures of 76% and 48% for the local population.

Assessment of functional grades at follow-up revealed that 42% of these 72 patients were disabled (four had died during their illness)—that is, grade 3, 4, or 5, compared with 21% so graded prior to the pneumonia. This disability grading was related to age, sex, social class, and smoking habits.

There were 30 patients (42%) classified as grades 3, 4, or 5, and 26 of these were over the age of 40. In this disabled group there were 17 (out of 34) males and 13 (out of 38) females. The numbers of disabled in the five social classes were small, but they did show rates that rose inversely with the social group—thus 33% of those in social class II were classified as disabled, 40% in class III, 43% in class IV, and 100% in class V. Among the smokers 50% of male smokers were disabled at follow-up and 33% of the non-smokers. The figures

for women were 30% for smokers and 33% for non-smokers.

A history of previous chest illness had adverse effects on the later assessment: 92% males with such a history were disabled and 60% of females.

Segmental Pneumonia

Segmental pneumonia occurred in 192 patients in this series (41% of total). The age distribution was quite different from lobar pneumonia and acute bronchitis (Table X), young children being more likely to suffer from segmental pneumonia than any other age-group.

TABLE X.—*Age Incidence of Segmental Pneumonia*

Age:	0-	10-	20-	30-	40-	50-	60-	70+	Total
Males ..	48	5	6	7	15	7	5	3	96
Females	36	2	6	13	16	10	6	7	96
Total	84	7	12	20	31	17	11	10	192
‰ ..	112	16	17	24	40	30	28	40	41

There was no difference in the two sexes. The social class pattern was almost the same as in lobar pneumonias, and its comparison with the population at risk is shown in Table XI.

TABLE XI.—*Social Class Distribution of Segmental Pneumonias*

Social Class:	I	II	III	IV	V
Segmental pneumonia	2	7	54	32	5
Practice	5	23	61	5	6

Here again there was a tendency for segmental pneumonia to occur most frequently in classes III and IV.

The smoking habits of the adults with segmental pneumonia showed that in males 74% were smokers and in females only 28% were smokers, compared with figures of 76% and 48% for the population at risk.

Functional grading at follow-up revealed a disability rate (grades 3, 4, and 5) of only 16%—that is, 31 out of 192 patients. Only one old man of 82 died during his illness. However, this figure of 16% was more than twice that of 6% who were so classified before the illness. Of the 31 patients who were classified as disabled, only 14 (45%) were over the age of 40. The two sexes were equally disabled—16 males and 15 females. Social class had some bearing on the proportions disabled; thus the rates were 21% in those belonging to social class II, 13% in class III, 20% in class IV, and 33% in class V. There was a tendency for smokers to suffer more from disability, the rates in men being 30% in smokers and 25% in non-smokers; and of women smokers 35% were disabled against only 12% of non-smokers. Those with a previous history of chest illness were much more likely to be disabled than those without such a history, the figures being 47% and 7% respectively.

Acute Bronchitis

This was the largest group of acute chest infections, and accounted for 43% of the total (200 patients). The age and sex distributions were quite different from the other two groups (Table XII). Males predominated by almost 3–2, and the greatest frequency was in the very young and the elderly.

TABLE XII.—*Age Incidence of Acute Bronchitis*

Age:	0-	10-	20-	30-	40-	50-	60-	70+	Total
Males ..	38	2	3	2	9	26	18	18	116
Females	24	1	—	3	14	8	15	19	84
Total	62	3	3	5	23	34	33	37	200
‰ ..	80	7	5	6	30	60	84	154	42

The social class distribution showed a greater tendency for the lower groups to be affected than was the case in the pneumonias (Table XIII); over one-half (52%) were in social classes IV and V compared with 11% for the practice.

TABLE XIII.—*Social Class Distribution in Acute Bronchitis*

Social Class:	I	II	III	IV	V
Acute bronchitis ..	1	5	42	36	16
Practice	5	23	61	5	6

The smoking habits again showed no great differences from those of the population at large. Amongst the men 86% were smokers (76% in the population) and only 37% of women smoked (48% in the population).

When the patients were functionally graded, after 5 to 10 years, the rate of disability was 71% compared with 38% before the attack. This rate of disability did not differ much with age. Of those over 40, 68% were disabled, and in those under 40 the rate was higher still, 74%. Men were more likely to be disabled (67%) than women (60%). Socially there was an increasing disability rate rising inversely with the social class, the rates being 50% in social class II, 64% in class III, 59% in class IV, and 78% in class V. Smokers were more likely to become disabled (84% in men and 73% in women) compared with non-smokers (50% and 69% respectively).

A history of previous chest trouble was much more likely to result in subsequent disability; thus, of 77 males with such a history, 62 (80%) were classified as disabled at follow-up, and out of 42 women 32 were disabled (76%). During the period of observation 17 men and 2 women died during an attack of acute bronchitis.

Discussion

The importance of studying and knowing the fate of one million victims who each year suffer from pneumonia or acute bronchitis scarcely requires stressing, but it is even more important still if we consider that according to this study there were twice as many disabled respiratory invalids at follow-up 5 to 10 years later than before the infection. Our knowledge of these conditions is still somewhat unsatisfactory. There is still much to discover outside the basic clinical facts. More epidemiological and sociological studies are required to find out who are these persons who suffer these attacks. Why do they fall sick? How many become disabled, and for what reasons? Only when such information is available can we think of applying successful preventive measures.

This review of the material in one general practice can only be looked upon as a pilot study in a single area of south-east London, but, nevertheless, some interesting facts have emerged which merit further discussion and consideration.

Application of accepted labels such as pneumonia and bronchitis are notoriously difficult in general practice, and it has been shown by Batty Shaw and Fry (1955) that there is little correlation between such diagnostic labels and pathological and bacteriological findings. However, one has to begin somewhere, so the terms lobar and segmental pneumonias and acute bronchitis were employed as defined. The age incidence of each of these clinical conditions was quite different.

The incidence of lobar pneumonia rose with age, segmental pneumonia was most frequent in young children, and acute bronchitis was most often found in the young and the elderly. Similar facts were observed in the report of the College of General Practitioners (1956). These three clinical conditions also had quite different disability rates at follow-up. The highest disability rate was found in those who had suffered from acute bronchitis (71%), and the lowest in those with segmental pneumonias (16%); that for lobar pneumonia was in between (42%). It was also found that the lower social classes were more likely to suffer from these acute chest infections, whereas only 11% of the practice population belonged to classes IV and V; 44% of the patients with these chest infections were in these two groups.

When the disabled group was analysed in an attempt to answer the questions *who* was disabled and *why*, some pointers emerged. Of those disabled 63% (118 out of 187) were over the age of 40. The disability rate for males (47%) was only a little higher than that for females (40%). It was very difficult to interpret the role of smoking because while 90% of disabled men were smokers (but then more than 76% of men in the London area are smokers) only 40% of the disabled women were smokers (in London 48% of women are smokers). It may well be that men were more susceptible to the effects of smoking and that they smoked more, or that women found it easier to give up once symptoms developed. More studies are obviously necessary to clear up this point.

The disabled group contained 53% in social classes IV and V, whereas only 11% of the practice were in these two classes. It seems fairly definite that the lower social groups are more likely to suffer disability after pneumonias and acute bronchitis. A previous history of chest trouble also had a marked adverse effect on the prognosis. The disability rate in those with such a history was 71%—almost twice that for the whole series, which was 40%.

A picture thus builds up that those *most* likely to develop disabilities from chest infections are men over 40 who smoke, who belong to social classes IV and V, and who have a previous history of chest troubles. There are also other factors which have not been taken into account here, but which must be considered—the environmental effects, such as atmospheric pollution, and occupational risks and genetic and familial influences. The treatment given may also play a part in influencing the ultimate course of the condition. All these facts require further assessment by planned long-term studies before prevention can be attempted.

Summary

424 patients who suffered from pneumonia or acute bronchitis in 1949–54 were followed up for 5 to 10 years and reassessed functionally in 1959.

As many as 43% were considered to be disabled according to the method of grading used, 9% were complete invalids, and 24 had died during the acute illness. This rate of disability was more than twice that present (21%) before the infection 5 to 10 years earlier.

Three distinct clinical conditions were recognized—lobar pneumonia, segmental pneumonia, and acute bronchitis.

Lobar pneumonia accounted for 15% of the whole series. The age incidence rose with age. The sex distribution was equal. It was more frequent in lower social groups, in male smokers, and in those with a previous history of chest illness. There was a disability rate of 42%, compared with 21% before the episode.

Segmental pneumonias were much the most frequent in young children. There was a disability rate at follow-up of only 16%, and some relations were noted with social classes and smoking; even this rate was much higher than the 6% before the infection.

Acute bronchitis had the unusual age incidence of being frequent in the young and the old. Disability at follow-up had occurred in 71%, and there were close associations with smoking, social classes, and previous chest illnesses. The initial disability rate had been 38%.

The importance of acute chest illnesses is evident from the fact that one million persons are affected each year and that 43% appear to be left with some disability, which is twice the initial figure. Preventive measures must take into account the associations between disability and age, sex, social class, smoking habits, past history, and environmental and genetic influences.

REFERENCES

College of General Practitioners (1956). *Brit. med. J.*, **1**, 1516.
Shaw, A. Batty, and Fry, J. (1955). Ibid., **2**, 1577.
Todd, G. F. (1959). *Statistics of Smoking*, 2nd ed. Tobacco Manufacturers' Standing Committee.

HYPOXIA AND THORACIC SCOLIOSIS

BY

D. B. SHAW, M.D., M.R.C.P., M.R.C.P.Ed.*

AND

JOHN READ, M.D., M.R.A.C.P.†

From the Department of Medicine, Postgraduate Medical School of London

It has been recognized for many years that thoracic deformity predisposes to the development of hypoxia and respiratory failure, but the mechanism by which these are brought about is not fully understood. Gray (1956) studied 22 patients with kyphoscoliosis, and concluded that the abnormalities in pulmonary function found in this condition were similar to those occurring in emphysema. This implies that the primary cause for the hypoxia in patients with a chest deformity is uneven distribution of air and blood within the lungs (Bates, Knott, and Christie, 1956). However, after investigating 16 patients, Schaub, Bühlmann, Kälin, and Wegmann (1954) reported that the main factor was alveolar hypoventilation. Fishman, Bergofsky, Turino, Jameson, and Richards (1956) and Hanley, Platts, Clifton, and Morris (1958) reached similar conclusions, and suggested that patients with thoracic deformities underventilated owing to restriction of the chest bellows.

The common association of chronic bronchitis with deformities of the chest tends to obscure the effect of the latter upon pulmonary function. Other difficulties in interpreting the results of pulmonary function studies in this condition are the variety of types of deformity and the lack, until recent years, of a satisfactory technique for measuring the relationship of ventilation to blood-flow within the lungs. The present study was

*Now at the Bristol Royal Hospital.
†Formerly Wunderly Travelling Scholar of the Royal College of Physicians: Now at the Department of Medicine, University of Sydney.

undertaken in an attempt to discover mechanisms by which deformity of the chest may predispose to hypoxia. It was confined to patients whose deformity was due to scoliosis of the thoracic spine, but included cases with and without bronchitis.

Material and Methods

Fourteen patients with severe scoliotic deformity of the thoracic spine were studied. In all cases the deformity had been present since adolescence and was obvious clinically. *X*-ray films of the two least severe cases are here shown (see Fig.). Nine patients had a past history of chronic winter bronchitis. Further details of the patients are given in Table I.

TABLE I.—*Clinical Data of Patients with Scoliosis*

Case No.	Sex and Age	Wt. (kg.)	Spinal Deformity		Duration of Bronchitis (Years)	Presenting Complaint	Present or Past Cardiac Failure
			Cause	Age at Onset			
1	M 23	57·9	Idiopathic	Childhood	17	Dyspnoea	– *
2	M 50	43·4	,,	,,	15	Cough	–
3	M 53	81·0	,,	,,	12	,,	+
4	M 34	47·7	Polio-myelitis	,,	16	Head-aches	+
5	F 36	31·8	Idiopathic	,,	Nil	Oedema	+
6	M 64	49·4	,,	,,	19	Dyspnoea	+
7	F 38	45·8	,,	,,	4	Cough	+
8	M 62	40·3	,,	Adoles-cence	11	Dyspnoea	+
9	M 72	43·6	Idiopathic +osteo-porosis and collapse	Childhood	Nil	Abdom-inal disten-sion	–
10	M 44	63·5	Idiopathic	Adoles-cence	25	Cough	–
11	M 22	52·8	Congenital	Birth	Nil	Back pain	–
12	F 39	50·0	Idiopathic	Childhood	,,	Chest pain	–
13	F 47	35·0	,,	,,	,,	M.M.R. pick up	–
14	M 57	45·0	,,	Adoles-cence	40	Cough	+

* Developed one year after.

Arterial Blood Gases.—These were studied in nine patients; in five the arterial samples were taken when the subjects attended the out-patient department, and in four after they had been treated in hospital. In all instances the patients were thought to be at their best; only one had no previous history of bronchitis. Arterial blood was collected from the brachial artery by percutaneous puncture after the skin had been anaesthetized with 2% procaine. Analysis for oxygen content, oxygen saturation, and total carbon dioxide content of the plasma was by the method of Van Slyke and Neill (1924). Blood *p*H was measured with a Cambridge *p*H meter, and the carbon dioxide tension was calculated from the total carbon dioxide content of the plasma and the *p*H by using the Henderson–Hasselbalch equation.

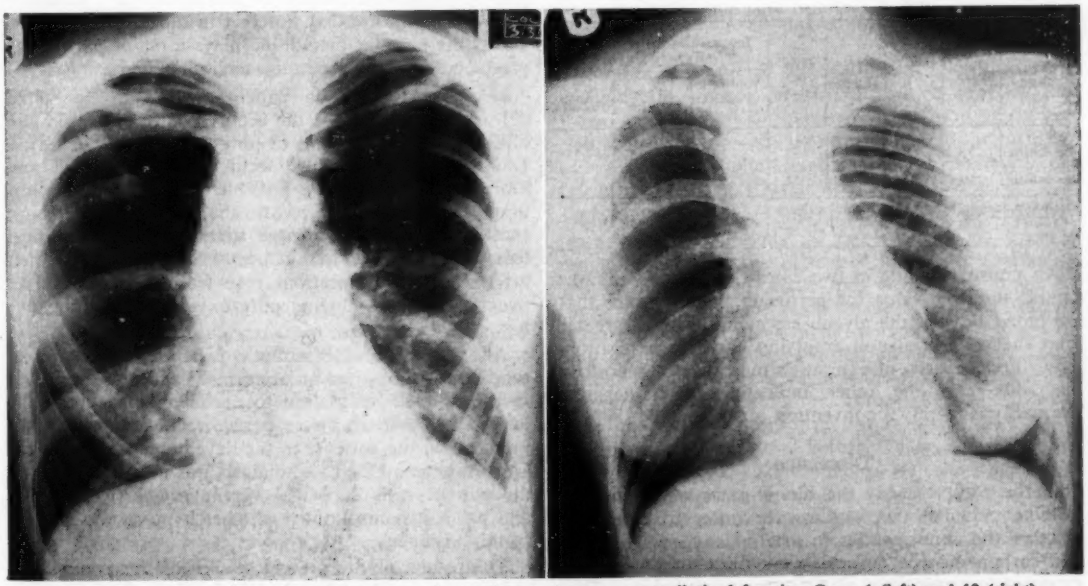
Pulmonary Function.—Static lung volumes were measured in three patients with a previous history of bronchitis and in four without. Other tests of pulmonary function were carried out in 10 patients, five of whom suffered from chronic bronchitis.

The one-second forced expiratory volume ($F.E.V._1$) and the vital capacity (V.C.) were measured by an automatic timing device (Gaensler, 1951). The amount of gas which could be expired in one second was expressed as a percentage of the vital capacity in order to give a measure of airways resistance, while the maximum breathing capacity (M.B.C.) was calculated from the $F.E.V._1$, using a factor of 35 (Thomson and Hugh-Jones, 1958). Lung volumes were measured, using the closed-circuit helium technique of Bates and Christie (1950). The evenness of distribution of gas and blood flow in the lungs and the relationship of ventilation to blood flow (ventilation–perfusion ratio) throughout the lungs were studied by recording the tensions of oxygen, carbon dioxide, and argon in expired gas. Gas analysis was carried out according to the single-breath procedure of West, Fowler, Hugh-Jones, and O'Donnell (1957), and using the multichannel respiratory mass spectrometer described by Fowler and Hugh-Jones (1957).

Results

Arterial Blood Gases

Blood gas studies were carried out in nine scoliotic subjects. The arterial oxygen saturation was below the normal range of 95–97% (Sunderman and Boerner, 1949) in all cases. The mean arterial oxygen saturation



Postero-anterior chest radiographs of the two patients with the least severe scoliotic deformity, Cases 1 (left) and 12 (right).

was 87.1%, with a range of 83–91%. Seven of the nine subjects had hypercapnia. The mean carbon dioxide tension was 48.6 mm. Hg, and the range was 36–62 mm.; the normal range is 35–45 mm. Hg (Sunderman and Boerner, 1949). The *p*H of arterial blood was within the normal range of 7.35–7.45 in every case.

Pulmonary Function

The M.B.C. was below the normal values quoted by Needham, Rogan, and McDonald (1954) in all of the 10 scoliotic patients studied. The reduction tended to be greater in those suffering from bronchitis, but the ranges of the two groups overlapped. The $F.E.V._1$ expressed as a percentage of the vital capacity was below the lower limit of the normal range (70% according to Needham *et al.*, 1954) in four of the five bronchitic patients. It was within the normal range in four of the five patients without bronchitis; in the exception (Case 9), the value was 63%.

The total lung capacity (T.L.C.) was below the range of values found by Needham *et al.* (1954) in normal subjects in five of the seven scoliotic patients investigated. Two patients had normal values; both had a previous history of bronchitis. In addition, in these two cases the reserve volume (R.V.) expressed as a percentage of the total lung capacity, was greatly increased, while in the other five the percentage was only slightly increased or within the normal range.

The most striking finding in the present investigation was some unevenness of ventilation or ventilation–perfusion ratio throughout the lung in every case compared with the normal standards of Read (1959). The inequality of ventilation–perfusion ratio was outside the normal range in nine subjects, gross abnormality being present in five. Abnormal inequality of ventilation was found in nine of the cases and inequality of perfusion in seven. The degree of unevenness of ventilation or of ventilation–perfusion ratio appeared to be irrespective of the presence or absence of bronchitis (see Table II).

TABLE II.—*Comparison of Pulmonary Function Data of Patients With and Without Bronchitis*

Mean Values	M.B.C.	F.E.V. % V.C.	T.L.C. (Litres)	R.V. % T.L.C.	Inequalities % per 500 ml. Expired Gas		
					Ventilation–Perfusion Ratio	Ventilation	Perfusion
With bronchitis	35	54	4·1	57	18	22	7
No bronchitis	50	81	2·7	42	19	23	4
Maximum inequalities for a normal subject aged 45					7	10	9

An unusual finding in two cases (Nos. 4 and 13) was a large negative value for perfusion. This means that the blood flow of the alveoli emptying last was greater than that of the alveoli emptying early in expiration. To call one pattern of expiration indicative of a positive inequality and the other indicative of a negative inequality is merely a convention of the method.

Discussion

In the present study the blood gases were analysed in nine patients with scoliosis in order to determine whether the abnormalities in arterial oxygen saturation and carbon dioxide tensions were those that would be expected to result from alveolar hypoventilation. Two of the patients had normal arterial carbon dioxide tensions in spite of reduced arterial oxygen saturations. Therefore alveolar ventilation cannot have been inadequate in these instances. In view of this finding in two cases, it is pertinent to check that hypoventilation was the only factor responsible for the hypoxia in the others.

If a subject is hypoxic owing to hypoventilation alone, the value for the arterial oxygen saturation associated with a given arterial tension of carbon dioxide can be deduced from the curves of Rahn and Fenn (1955). This was done for the patients of the present study, assuming a respiratory quotient of 0.8, and in all instances the predicted arterial oxygen saturation was higher than the observed value. In six patients the difference was 6% or more. It would seem likely, therefore, that in most of the patients in the present series some factor other than hypoventilation prevented a full oxygenation of the blood. If the above analysis is applied to the data of the other workers, one of the eight cases reported by Chapman *et al.* (1939), 2 out of 16 cases reported by Schaub *et al.* (1954), and 12 out of the 24 cases described by Hanley *et al.* (1958) had a degree of hypoxia which was out of proportion to the severity of the carbon dioxide retention.

There are three types of disturbances of pulmonary function, other than alveolar hypoventilation, which might be responsible for hypoxia in scoliotic patients. These are a defect in diffusion of oxygen across the alveolar membrane, shunting of blood through non-aerated segments of the lungs, and uneven distribution of gas and blood throughout the lungs. The ability of oxygen to diffuse from the alveoli into the pulmonary capillaries is usually inferred from studies of the behaviour of carbon monoxide. Kjerulf-Jensen and Kruhøffer (1954) found that the diffusing capacity for ^{14}C-labelled carbon monoxide was abnormally low in a patient with a gross reduction in T.L.C. due to kyphoscoliosis. However, as these authors pointed out, decrease in diffusing capacity to as little as 25% of normal would be associated with a drop in resting arterial oxygen saturation of less than 1%. It seems unlikely, therefore, that a defect in diffusion of oxygen across the alveolar membrane plays a major part in the production of hypoxia in the scoliotic patient.

Necropsy reports on patients with thoracic spinal deformities often stress the occurrence of collapsed and underdeveloped segments of lung (Kerwin, 1942; Lewis, Daines, Samuels, and Hecht, 1952; Fischer and Dolehide, 1954), and it is possible that these might allow unoxygenated blood to pass to the left side of the heart. In the present series a large shunt was excluded in at least two of the subjects (Cases 1 and 4), because their arterial oxygen saturations rose from 86 and 88% to over 100% after inhaling pure oxygen through a valve box.

All but one of the scoliotic patients investigated in the present series had an abnormal degree of inequality in the ratio of ventilation to perfusion throughout the lung. It would seem reasonable to conclude that this predisposed the patients to the development of hypoxia. Unfortunately, blood gas analysis was not performed on the patient with a normal ventilation–perfusion ratio, and hence it is not known whether hypoxia was present in this instance.

The results of the present studies of the evenness of pulmonary ventilation and perfusion in scoliotic patients

differ from those reported by Fishman *et al.* (1956) and Hanley *et al.* (1958). One possible explanation is that there was some difference between the type of patient included in the various series. In fact, the investigation reported here was restricted to patients with a thoracic scoliotic deformity which had developed before adult life, whereas previous workers have tended to include a variety of deformities, some of recent onset.

It has already been pointed out that patients with deformed chests often suffer from chronic bronchitis. Therefore it might be suggested that this condition was responsible for some abnormalities in pulmonary function found in scoliotic patients. Certainly in the present investigation the results of spirometric and static lung-volume studies differed between patients with and without bronchitis. However, the evenness of ventilation, and ventilation–perfusion ratio, were disturbed to a similar extent in both groups of subjects. It would therefore seem likely that the deformity of the lungs associated with thoracic scoliosis was the prime cause of the abnormalities in ventilation and perfusion.

The way in which deformity of the chest produced the abnormalities in distribution of air and blood within the lungs in the subjects of the present study is uncertain. The uneven ventilation might have been due to bronchial distortion or to restriction of some lung segments. It is less easy to understand the factors underlying the uneven blood flow. The large negative value for perfusion which was present in two scoliotic subjects has not been seen in emphysema (Read, 1959) or in interstitial pulmonary disease (Read and Williams, 1959). It implies that in these two cases there were regions of the lung in which poorly ventilated alveoli were relatively well perfused. Such areas might well lie in partially collapsed lung segments.

In conclusion, it is suggested that scoliosis of the dorsal spine may be associated with abnormalities of the ventilation–perfusion ratio throughout the lungs, even in the absence of bronchitis. This disturbance of pulmonary function, in addition to alveolar hypoventilation, predisposes the scoliotic patient to hypoxia.

Summary

Pulmonary function was studied in 14 patients with severe scoliosis of the thoracic spine. Arterial blood gas analysis was performed in nine; estimation of vital capacity, one-second forced expiratory volume, evenness of ventilation, and ventilation–perfusion ratio were made in 10, and static lung volumes were measured in seven.

In all cases the arterial oxygen saturation was found to be lower than would be expected from alveolar hypoventilation alone.

The maximum breathing capacity was reduced in all cases. Patients who suffered from bronchitis in addition to scoliosis tended to have a marked increase in airways resistance and some increase in reserve volume. Those without bronchitis had a normal degree of airways resistance and residual volume, but a reduction in total lung capacity.

Both patients with and without a history of bronchitis showed abnormalities of distribution of gas and blood flow, and ventilation–perfusion ratio, throughout the lungs. It is suggested that these disturbances of pulmonary function were due to scoliosis, and that they predisposed to the development of hypoxia.

We are indebted to Dr. C. M. Fletcher, Dr. P. Hugh-Jones, Dr. J. Livingstone, and Dr. T. Simpson for allowing us to study their patients, and to Miss Joyce Gardiner and Miss Heather MacLeish for technical assistance. We thank Dr. J. West for reading through the manuscript.

BIBLIOGRAPHY

Bates, D. V., and Christie, R. V. (1950). *Clin. Sci.*, **9**, 17.
—— Knott, J. M. S., and Christie, R. V. (1956). *Quart. J. Med.*, **25**, 137.
Chapman, E. M., Dill, D. B., and Graybiel, A. (1939). *Medicine (Baltimore)*, **18**, 167.
Fischer, J. W., and Dolehide, R. A. (1954). *A.M.A. Arch. intern. Med.*, **93**, 687.
Fishman, A. P., Bergofsky, E. H., Turino, G. M., Jameson, A. G., and Richards, D. W. (1956). *Circulation*, **14**, 935.
Fowler, K. T., and Hugh-Jones, P. (1957). *Brit. med. J.*, **1**, 1205.
Gaensler, E. A. (1951). *Science*, **114**, 444.
Gray, F. D. (1956). *J. chron. Dis.*, **4**, 499.
Hanley, T., Platts, M. M., Clifton, M., and Morris, T. L. (1958). *Quart. J. Med.*, **27**, 155.
Kerwin, A. J. (1942). *Arch. intern. Med.*, **69**, 560.
Kjerulf-Jensen, K., and Kruhøffer, P. (1954). *Acta med. scand.*, **150**, 395.
Lewis, C. S., Daines, M. C., Samuels, A. J., and Hecht, H. H. (1952). *Dis. Chest*, **22**, 261.
Needham, C. D., Rogan, M. C., and McDonald, I. (1954). *Thorax*, **9**, 313.
Rahn, H., and Fenn, W. O. (1955). *A Graphical Analysis of the Respiratory Gas Exchange*. The American Physiological Society, Washington, D.C.
Read, J. (1959). *Clin. Sci.*, **18**, 465.
—— and Williams, R. S. (1959). *Amer. J. Med.*, **27**, 545.
Schaub, F., Bühlmann, A., Kälin, R., and Wegmann, T. (1954). *Schweiz. med. Wschr.*, **84**, 1147.
Sunderman, F. W., and Boerner, F. (1949). *Normal Values in Clinical Medicine*. Saunders, Philadelphia.
Thomson, W. B., and Hugh-Jones, P. (1958). *Brit. med. J.*, **1**, 1093.
Van Slyke, D. D., and Neill, J. M. (1924). *J. biol. Chem.*, **61**, 523.
West, J. B., Fowler, K. T., Hugh-Jones, P., and O'Donnell, T. V. (1957). *Clin. Sci.*, **16**, 529.

MANAGEMENT OF ACUTE MYOCARDIAL INFARCTION COMPLICATED BY HAEMATEMESIS

BY

P. CURZEN, M.B., B.Sc., D.Obst.R.C.O.G.
Late House-Physician, Edgware General Hospital

The administration of anticoagulants to patients with coronary thrombosis is almost routine practice, and there is substantial evidence that this treatment significantly reduces the mortality rate and the incidence of thrombo-embolic complications (Tulloch and Gilchrist, 1950; McCluskie and Seaton, 1959).

One of the main contraindications to anticoagulant therapy is the presence of haemorrhage or haemorrhagic tendency in the patient. Severity of the infarct and the presence of shock may outweigh the risk of further haemorrhage and make the use of an anticoagulant justifiable and necessary. The use of long-acting anticoagulants in the presence of a possible further haemorrhage is inadvisable in view of the fact that their action cannot be immediately antagonized, since the administration of intravenous vitamin K_1 leaves a period of hours before the prothrombin time returns to normal. The anticoagulant of choice under these circumstances is heparin; its activity is rapidly antagonized by intravenous protamine sulphate, but it has the disadvantage that for maximum efficiency it has to be given intravenously, and at intervals of four to six hours. Even with heparin great care is necessary.

The greater effectiveness of the intravenous over the intramuscular route has been demonstrated by Bauer *et al.* (1950) and by Wynn *et al.* (1952), and these workers have maintained patients on intravenous heparin for up to 14 days. A case is presented where intravenous heparinization was maintained for 3½ weeks using a " polythene " cannula with a Gordh adapter.

Technique

The materials used were a 6-in. (15-cm.) length of size 2 polythene cannula, a polythene adapter, a Gordh adapter, and a French needle (see Fig. 1).

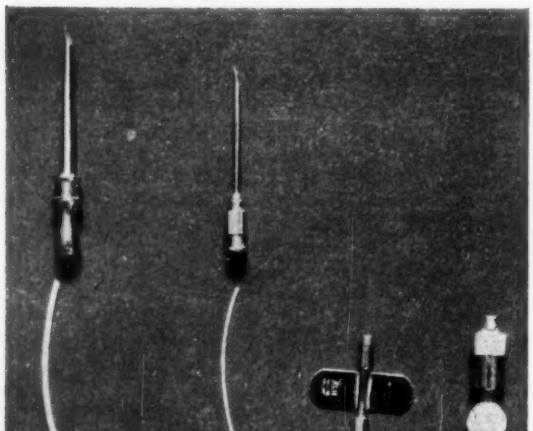


FIG. 1.—Apparatus for intravenous injection of heparin. Materials required.

FIG. 2.—The apparatus in position.

The venous return in the right arm was obstructed by a sphygmomanometer cuff inflated to 60 mm., and the largest vein in the antecubital fossa was selected. A subcutaneous weal of local anaesthetic (2% procaine) was raised, and the tip of the French needle introduced a few millimetres subcutaneously and superficial to the vein, before penetrating the vein a short distance (as indicated by the free reflux of blood through the needle). The polythene cannula was then introduced through the needle, the needle withdrawn, and the polythene adapter fitted to the free end of the polythene cannula. Then 2 ml. of a 3.8% solution of sodium citrate was injected through the cannula by attaching a syringe to the polythene adapter, and after removing the syringe a Gordh adapter was fitted to the polythene adapter. By means of a syringe with a fine hypodermic needle (size 14) 10,000 units of heparin was injected into the Gordh adapter. A firm dressing was then applied to the site of entry of the cannula into the vein, and the various attachments were secured with strapping. Strict aseptic technique and sterilized materials were used throughout.

The French needle is rather large for introducing the cannula. If instead of using a size 2 polythene cannula the smaller size 1 cannula is used, this can easily be introduced through a size 14 aspirating needle, which is little bigger than the standard transfusion needle. Alternatively, the larger size of polythene can be introduced through a cut-down on a vein, as was done at a later stage in the same patient (see Fig. 2).

Clinical History

The patient, a housewife aged 43, was admitted to hospital on March 10, 1960, with a history of retrosternal pain and haematemesis. The night before her admission she had been seized with a severe upper retrosternal pain radiating through to the back between the shoulder-blades and down the right arm as far as the elbow. The pain had persisted, keeping her awake through the night, and had been associated with dyspnoea at rest. On the afternoon of her admission she vomited twice; the total quantity of vomit was estimated as about 10 oz. (284 ml.), and was described by the patient as being a brown fluid with particles " like tea-leaves " in it. Direct questioning failed to elicit any history of angina of effort or of indigestion in the past, but the patient did admit to having taken aspirin for a considerable period of time to relieve headaches, to which she was prone. In her personal history there was nothing of significance; her appetite was " fair," bowels regular, weight steady, micturition normal, menses regular 7/28, and she was a fairly heavy smoker. She had been admitted to the Edgware General Hospital in December, 1959, for haematemesis, which had not been severe enough to require transfusion, and for which subsequent barium-meal examination had shown no apparent cause.

On admission she was an anxious-looking woman, in pain, restless, and slightly dyspnoeic. There was no cyanosis, and she did not appear shocked. The pulse was 84 a minute, regular, and of good volume; blood pressure 130/90. In the cardiovascular system the jugular venous pressure was raised to ½ in. (1.3 cm.) above the sternal angle, and the only other abnormal finding was a gallop rhythm in a heart which was of normal size clinically. In the respiratory system the only abnormal finding was some fine rales at both bases. There were no abnormalities in any of the other systems, the abdomen being soft, with no tenderness and no palpable masses.

The haemoglobin on admission was 72%; total white cell count 10,600/c.mm., with a normal differential. The electrocardiograph showed signs of a recent extensive full-thickness anterior myocardial infarct.

In view of the history of haematemesis it was decided not to give her anticoagulants, and she was treated with absolute bed-rest and sedation. On this regime she made good progress, the signs of congestive failure disappearing within two days of admission, although the gallop rhythm persisted. Fifteen days after admission she suddenly collapsed with severe retrosternal pain, and on examination

was shocked, with a blood-pressure of 90/60, and a jugular venous pressure raised to the angles of the jaws. She was given 10 mg. of morphine and 1 mg. of "digoxin" intravenously, and 10 mg. of metaraminol intramuscularly. It was decided that she had probably had an extension of the original infarct, and that her condition was so serious that immediate treatment with anticoagulant drugs was indicated. To this end the polythene cannula, with the attachments described above, was introduced into the median basilic vein in the right antecubital fossa and 10,000 units of heparin given four-hourly. This treatment, and frequent intramuscular injections of metaraminol, succeeded in maintaining her systolic blood-pressure above 100 mm., and the maintenance of digitalization by mouth successfully controlled the congestive cardiac failure. However, her general condition remained poor. She was cold and clammy, with a tinge of cyanosis, and eight days after the commencement of intravenous heparin she again collapsed, the blood-pressure being 70/? and showing no response to intramuscular metaraminol.

At this stage a noradrenaline drip (1 mg. noradrenaline in 500 ml. of 5% dextrose) was started, the Gordh adapter being removed from the polythene adapter, to which the drip connexion was then attached. By this means the systolic blood-pressure was maintained at a level of 110–130 mm., and administration of heparin was continued via the tubing of the drip set. It was necessary to continue the noradrenaline drip for three days before the patient's blood-pressure could be maintained on intramuscular metaraminol again. At this stage, 11 days after the insertion of the polythene cannula, there were marked signs of a local phlebitis along the course of the cannula, and it was removed. Since it was felt necessary to continue with the intravenous heparin, the polythene cannula was reinserted through the cut-down over the long saphenous vein at the right ankle, and by this means heparinization continued for a further 12 days.

The patient's general condition improved, and three days after the insertion of the polythene cannula at the ankle it was possible to maintain her blood-pressure without further assistance from pressor drugs. The good progress was maintained, and when the cannula had been in place for 12 days and phlebitis again developed it was decided that intravenous heparin could be discontinued. Her further course was uneventful, and cautious mobilization was begun. As soon as this was advanced enough she was submitted to a barium-meal examination to determine the cause of the haematemesis. This examination revealed no abnormality in the stomach or duodenum, and it was concluded that the haematemesis had resulted from an acute gastric erosion probably related to her habit of taking aspirin. Long-term treatment with anticoagulants was begun, using phenindione, and she was discharged from hospital on May 11, 1960.

Discussion

The possibility of using a polythene cannula as a means of introducing heparin intravenously at frequent intervals for a period of 23 days altogether was established in this case. The useful life of one cannula, as determined by the onset of thrombophlebitis, appeared to be approximately 11–12 days. Once *in situ*, it served as a useful channel for the administration of continuous pressor drugs when the patient collapsed. In shock, the setting up of a transfusion is frequently difficult and may require the use of a cut-down, so that the presence of an intravenous cannula is an obvious advantage. Furthermore, the size 2 polythene cannula is large enough for the transfusion of blood, so that if this patient had in fact had a further haematemesis it would have been possible to transfuse her through the same route. The disadvantage of size 2 cannula is that the only needle large enough to serve as a means of introducing it is the French needle, which presupposes the presence of fairly large veins, unless a cut-down is to be resorted to. The use of size 1 polythene cannula, in combination with a size 14 aspirating needle as a means of introduction, makes the use of a polythene cannula a little more difficult than a routine push-in transfusion, and this size of cannula is quite large enough to take clear transfusion fluids, such as a noradrenaline drip.

Summary

A case of acute myocardial infarction complicated by haematemesis is described.

Treatment was by intravenous heparin introduced through a polythene cannula.

It was found that the useful life of one cannula was 11–12 days.

In addition to serving as the route of administration of four-hourly heparin, the cannula was used to administer pressor drugs continuously when the patient collapsed.

My thanks are due to Dr. L. I. M. Castleden for his encouragement, and for permission to report this case; to Miss Shaw who prepared the photographs; and to Miss Ward for assistance with the secretarial work.

REFERENCES

Bauer, G., Boström, H., Jorpes, E., and Kallner, S. (1950). *Acta med. scand.*, **136**, 188.
McCluskie, J. A. W., and Seaton, D. A. (1959). *Scot. med. J.*, **4**, 305.
Tulloch, J. A., and Gilchrist, A. R. (1950). *Brit. med. J.*, **2**, 965.
Wynn, A., Goodwin, J. F., and Birkbeck, A. (1952). Ibid., **1**, 893.

INVESTIGATION INTO METHODS OF COLLECTION OF URINE FOR CULTURE FROM MEN AND WOMEN

BY

S. H. C. CLARKE, F.R.C.S.

Consulting Urologist, Brighton, Lewes, and Mid-Sussex Hospitals

The main purpose of this investigation was to see if it was possible to collect a satisfactory mid-stream specimen of urine from women. The collection of specimens of urine from men is also considered for comparison.

It is generally agreed that mid-stream specimens from men are satisfactory for culture, but in women it is said that the only satisfactory specimen is one taken by catheter.

I am sure that few would undertake catheterization of the male without a very good reason. On the other hand, catheterization of the female is done at the least provocation, and, what is more, the job is often left to the most junior nurse. I think that this difference is mainly due to the difficulty of it in the male and the ease of it in the female. Urologists have for some time stressed the danger of infection from catheterization in the male, but there has not been the same feeling about the female.

Although I have not kept a record of the cases, and therefore have no figures, I have noticed that some women, sent to my clinic with a chronic urinary

infection, date the start of their trouble from a previous catheterization, often for gynaecological reasons. It was this fact that prompted me to start this investigation.

Method of Collection

There has been no selection of cases, except that all specimens of urine have been collected in the out-patient department during a busy urological out-patient clinic.

1. Mid-stream urines were collected from men, without preliminary cleaning of the glans penis, by getting them to pass the first portion of their urine into an unsterile container and the next portion into a sterile container, with the usual precautions about touching the inside of the latter.

2. Mid-stream urines collected from women were immediately followed by the taking of a catheter specimen. The mid-stream urines were collected after a nurse had given the vulva a good wash with soap and water, but without antiseptics, by getting the women to pass the first portion into an unsterile container and the next portion into a sterile container. This was immediately followed by the collection of a catheter specimen of urine.

3. Catheter specimens of urine were collected from men mostly at cystoscopy.

4. Catheter specimens of urine collected from women included the catheter specimens taken immediately after a mid-stream urine, a few other catheter specimens, and those taken at the time of cystoscopy.

Method of Analysis

During January to March, 1960, 423 specimens of urine were collected in the urological out-patient clinic; 81 have been excluded from the analysis. Of these, 69 showed active infection; they had more than five white cells per high-power field in the centrifuged deposit and a growth on culture. It is not possible to say whether these specimens were contaminated in addition to the presence of active infection, therefore they are excluded from the analysis. Twelve mid-stream urines were taken from women without a following catheter specimen. They are also excluded, as there was no catheter specimen with which to compare the mid-stream urine. This leaves 342 specimens for consideration.

For the purpose of analysis these 342 specimens have been classified as satisfactory or unsatisfactory.

Satisfactory.—Those with no growth or only scanty growth—that is, less than 15 colonies on a plate—have been considered satisfactory. This means that such scanty growth can only be a contaminant and that therefore there is no active infection or significant bacilluria.

Unsatisfactory.—I believe that a chronic bacilluria with fewer than five white cells per high-power field in the centrifuged deposit can cause recurrent active urinary infection and may be the only evidence found between acute attacks. This is not uncommon in patients who have had a lot of treatment. I agree that all such positive urine cultures are suspect of contamination and should be repeated. Therefore with more than a scanty growth (15 colonies), I feel one cannot be certain that it is only contamination. The growth may indicate a significant bacilluria despite the absence of pyuria—that is, more than five white cells per field. These specimens are accordingly classed as unsatisfactory. It must be remembered that all specimens with more than five white cells per field and a growth on culture have already been excluded from the series as evidence of active infection of the urinary tract.

A note was also made of the time at which the specimen was collected and the time at which it was cultured. It is therefore possible to compare specimens cultured the same day with those cultured the following day, with regard to the relative numbers of satisfactory and unsatisfactory specimens, and so form some idea of the effect on the result of delay in setting up the culture.

Analysis

Of the 114 mid-stream urines from men (Table I), 84 (74%) were satisfactory (no growth in 82 and only scanty growth in 2) and 30 were unsatisfactory (more than 15 colonies on culture, but not more than 5 white cells per field).

Of the 67 mid-stream urines taken from women and immediately followed by the taking of a catheter specimen (Table I), 40 (60%) were satisfactory (no growth in 22 and only scanty growth in 18) and 27 were unsatisfactory (more than 15 colonies on culture, but not more than 5 white cells per field). This means that it is possible to say almost certainly that any growth is contamination. Of these 67 specimens, 13 had growth in both catheter and mid-stream urine and should therefore be excluded, as one cannot be sure that some of them are not significant bacillurias (see above). This would leave 54 mid-stream urines for analysis. In all of these 54 pairs the catheter specimen of urine was sterile, therefore any growth in the mid-stream specimen must be a contaminant. Of these 54 mid-stream urines from women (Table I), 39 (72%) were satisfactory (no growth in 22 and only scanty growth in 17) and 15 were unsatisfactory.

TABLE I.—*Analysis of Specimens*

	No. of Specimens Analysed	Satisfactory Specimens	Unsatisfactory Specimens
Male mid-streams	114	84 (74%)	30
Female ,, ...	67	40 (60%)	27
,, ,, less 13 (see text)	54	39 (72%)	15
Male catheter	44	41 (93%)	3
Female ,, ...	117	99 (85%)	18

Specimens collected, 423; 81 were excluded, leaving 342 for analysis.

For comparison, the catheter specimens taken from men and women were analysed. Of 44 catheter specimens from men (Table I), 41 (93%) were satisfactory (no growth in 39 and only scanty growth in 2) and 3 were unsatisfactory (more than scanty growth). Of 117 catheter specimens from women (Table I), 99 (85%) were satisfactory (no growth in 96 and only scanty growth in 3) and 18 were unsatisfactory.

Effect of Delay

In considering the effect of delay I have compared specimens cultured the day they were taken with those cultured next day.

In men, out of 48 mid-stream samples cultured the same day (Table II), 41 (85%) were satisfactory (no growth), whereas of 66 cultured the following day, only 43 (65%) were satisfactory (no growth in 41 and only scanty growth in 2). With women the position is even worse, for of 50 mid-stream urines cultured the same day (Table II), 36 (72%) were satisfactory (no growth in 19 and only scanty growth in 17); but of 17 mid-stream specimens cultured the following day, only 4 (24%) were satisfactory (no growth in 2 and only scanty

TABLE II.—*Effect of Delay in Culture*

		No. Specimens Analysed	Satisfactory Specimens	Unsatisfactory Specimens
Male mid-streams	Same day ..	48	41 (85%)	7
	Next ,, ..	66	43 (65%)	23
Female ,,	Same day ..	50	36 (72%)	14
	Next ,, ..	17	4 (24%)	13
,, ,, less 13 (see text)	Same day ..	45	36 (80%)	9
	Next ,, ..	9	3 (33%)	6
Male catheter	Same day ..	11	11 (100%)	0
	Next ,, ...	33	30 (91%)	3
Female ,,	Same day ..	73	65 (88%)	8
	Next ,, ...	44	34 (77%)	10

growth in 2). If we exclude the 13 instances in which both catheter and mid-stream urines were infected, we are left with 45 cultured the same day, of which 36 (80%) were satisfactory, and 9 cultured the following day, of which 3 (33%) were satisfactory.

With catheter specimens of urine the effect of delay is not quite so disastrous. All 11 male catheter specimens cultured the same day were satisfactory (no growth in 10 and only scanty growth in 1), and of 33 cultured on the next day 30 (91%) were satisfactory (no growth in 29 and only scanty growth in 1). With regard to 73 female catheter specimens cultured the same day, 65 (88%) were satisfactory (no growth in 64 and only scanty growth in 1), and of 44 cultured the following day, 34 (77%) were satisfactory (no growth in 32 and only scanty growth in 2).

Discussion

A similar investigation was carried out by Boshell and Sanford (1958). However, they took only an occasional catheter specimen to compare with their series of mid-stream urines collected from women. They claimed that the specimens were very comparable in the two techniques. They also stressed the danger of introducing infection by catheterization.

Riley (1958) carried out a similar investigation. He compared a mid-stream urine with a catheter specimen taken later the same day, but not at the same time. He also claims that there was good correlation in the results of the two specimens, but many of his cases were already infected and therefore he had to rely on bacterial counts. However, he formed the opinion that a mid-stream specimen of urine taken from the female could give a satisfactory result and might therefore obviate the necessity for a catheter specimen with its attendant danger of introducing infection.

Wood, Pinkerton, and Calman (1960) also carried out an investigation very comparable to the present one in that they had excluded cases of clinical urinary infection. They found that of 40 mid-stream specimens collected, a positive culture was obtained in 6 when the catheter specimen was sterile. In the remaining 34 the mid-stream urine was comparable to the catheter specimen. They used ante-partum and puerperal cases and stated that they considered that they had made a case for the use of mid-stream rather than catheter specimens in women. They also stressed the danger that catheterization might introduce infection.

The results of the present investigation are very similar. The finding that 72% of the mid-stream urines collected from women were satisfactory compares very favourably with the results from men, in which 74% of the mid-stream urines were satisfactory. In other words, one could say that there was no significant bacilluria or active infection of the urinary tract. If there was any doubt about the presence of significant bacilluria, one would have to repeat the mid-stream urine or have a catheter specimen; but this would hardly be necessary if an obvious active infection was present with more than five white cells per field. Even if one only avoided having to catheterize 50% of the cases, I still feel that this would be well worth while, but I think that in actual practice, bearing in mind the results of this investigation, it would be possible to avoid catheterization in probably about 75% of women.

There is nothing significant about the results of the catheter specimens, which simply bear out the well-known fact that catheter specimens are better than mid-stream.

With these results in mind, it would seem possible to obtain a reasonable number of satisfactory mid-stream urines from women. If this is the case, and I think it is, I would like to make a very strong plea for the abandonment of the routine catheter specimen in women and substitute a routine mid-stream urine. I am sure that the danger of introducing infection is no less in women than in men and may even be greater.

These results also clearly show the importance of culturing the urine as soon as possible, and certainly not later than the same day. This is especially important in mid-stream urines from women, where there is a striking difference between the percentage of satisfactory specimens cultured the same day and those cultured the next day—80% as compared with 33%. I know that this figure of 33% is based on the analysis of only nine specimens, but I am sure that this is a true indication.

Summary

A plea is made for the abandonment of routine catheterization to obtain specimens of urine for culture from women, and a case is presented to show that satisfactory mid-stream urines can be obtained without too much trouble. It is claimed that the 74% satisfactory mid-stream specimens taken from men and the 72% from women justify this claim and that these figures compare very favourably with the respective figures for catheter specimens—93% in men and 85% in women. The investigation also demonstrates the disadvantages of delay in initiating the culture, especially in mid-stream urines from women. It is hoped to minimize this with refrigeration, and a further series will be carried out with this end in view, for it may not always be possible to get the urine cultured on the day the specimen is taken.

My thanks are due to Sister Goatcher, sister-in-charge of out-patients, Hove General Hospital, and to Dr. I. W. Haydu, bacteriologist, Royal Sussex County Hospital, and to their staffs for all the work they put in to enable this investigation to be carried out.

REFERENCES

Boshell, B. R., and Sanford, J. P. (1958). *Ann. intern. Med.*, **48**, 1040.
Riley, H. D. (1958). *J. Lab. clin. Med.*, **52**, 840.
Wood, E. C., Pinkerton, J. H. M., and Calman, R. M. (1960). *Brit. med. J.*, **1**, 961.

The *Annual Report 1959* of the Tanganyika Health Services records a notable increase in demand for hospital services. Compared with 1958, diseases diagnosed in in-patients rose by 3,485, an increase of 1.6%, while diagnoses in out-patients rose by 127,513, an increase of 8% on the 1958 figures, giving an overall increase in hospital usage of 7.4%.

SUBACUTE COMBINED DEGENERATION OF THE CORD AFTER PARTIAL GASTRECTOMY

BY

J. D. E. KNOX, M.B., M.R.C.P.Ed.
Formerly Registrar in Medicine

AND

I. W. DELAMORE, M.B., M.R.C.P.Ed.
Registrar in Medicine

From the University Department of Medicine and Royal Infirmary, Edinburgh

The occurrence of anaemia after partial gastrectomy is common and has attracted considerable interest in recent years (*Brit. med. J.*, 1959). It is usually the consequence of deficiency of iron (Baird *et al.*, 1959), but may occasionally be associated with megaloblastic erythropoiesis. Since this latter condition is usually due to vitamin-B_{12} deficiency and responds to treatment with cyanocobalamin given by injection, it might be expected that subacute combined degeneration of the cord (S.C.D.) would occasionally result. In fact, however, reports of such a development are remarkably few, the two cases described by Rowlands and Simpson (1932) being the only ones of which we are aware. In both of their patients the operation had been carried out because of the presence of a large gastric ulcer, but in one the diagnosis of S.C.D. was in doubt, in view of the fact that the patient had a positive Wassermann reaction. The ulcer in this case was thought to be syphilitic in origin. In the second patient the ulcer was proved histologically to be carcinomatous.

Because of the extreme rarity of S.C.D. after partial gastrectomy for peptic ulceration and because we were able to apply current investigative techniques, we report the following case.

Case Report

A high-grade mentally defective patient aged 32, an unemployed labourer, was admitted to hospital on October 17, 1959, with a three-months history of progressive weakness and unsteadiness of his legs. In March, 1949, he had been admitted to hospital for the third time within a period of a year because of gastro-intestinal haemorrhage. A barium-meal examination revealed a large gastric ulcer on the posterior aspect of the lesser curvature just above the incisura, associated with coarsening of the mucosal pattern, and an all-night gastric analysis showed hypersecretion of hydrochloric acid. On April 8, 1949, a Polya gastrectomy removing three-quarters of the stomach, and careful examination of the ulcer, failed to reveal any evidence of malignancy.

After the operation the patient had no complaints referable to the stomach, but he remained unemployed on account of his mental incapacity. On July 15, 1959 (ten years after the operation), he was readmitted to a surgical ward with symptoms of subacute intestinal obstruction. At that time the haemoglobin level was 12.1 g./100 ml., the red-cell count 3,500,000/c.mm., and colour index 1.2. The blood film showed anisocytosis and macrocytosis of the red blood cells, together with some hypochromia. At operation two days later intestinal obstruction was found due to a fibrous band running across the distal ileum. This band was divided and the obstruction relieved. The previous partial gastrectomy was examined and no abnormality was noted.

He was discharged on July 24, and he then developed paraesthesiae in the palms of both hands and later in both thighs. This was associated with progressive numbness and stiffness in all four limbs, and he noticed that he was prone to drop things. His disability progressed, and when he was readmitted on October 17 he was almost bedridden. He made no complaint of sore tongue or diarrhoea. There was no obvious dietary deficiency. Before this admission to hospital he had been given no haematinic therapy.

Examination showed him to be a thin, ill-looking man, of low intelligence. The mucous membranes were pale, and the tongue was clean and markedly atrophic. Koilonychia was not present, and there was no enlargement of the liver or spleen. Cranial-nerve function was intact, but there was generalized hypotonia and loss of muscle power. Tendon reflexes were elicited with difficulty, and both ankle-jerks were absent. The abdominal reflexes were absent, and the left plantar response was extensor. Vibration sense was absent in both legs up to and including the anterior superior iliac spine, but was present in the arms. Position sense was severely impaired in both legs and to a less extent in the arms, but tactile and thermal sensations were intact. There was muscle tenderness in both calves; no sphincter disturbance was present.

Investigations.—The haemoglobin level was 9 g./100 ml., red-cell count 3,630,000/c.mm.; colour index 0.8; packed cell volume 34%, mean corpuscular volume 94 cubic microns, mean corpuscular haemoglobin concentration 26%, white-cell count 5,600/c.mm., erythrocyte sedimentation rate 15 mm. in the first hour (Westergren). A blood film showed anisocytosis and macrocytosis of the red cells, but the picture was dimorphic, many of the cells being hypochromic. The bone-marrow was megaloblastic. The Wassermann reaction and Kahn test were negative; *x*-ray examination of the chest, skull, and cervical spine showed no significant abnormality. A lumbar puncture produced clear, colourless cerebrospinal fluid under normal pressure, and contained 1 cell per c.mm. The protein content was 69 mg./100 ml. and the sugar 67 mg./100 ml.

Studies of Vitamin-B_{12} Metabolism.—The pretreatment serum vitamin-B_{12} level was 90 $\mu\mu$g./ml., as estimated by microbiological assay using *Lactobacillus leichmannii* as the test organism (Girdwood, 1960) (normal values, 110–810 $\mu\mu$g./ml.). Malabsorption of cyanocobalamin was demonstrated by the faecal test of Heinle *et al.* (1952) (81% faecal recovery of radioactivity after 0.5 μg. oral dose of ^{58}Co-labelled cyanocobalamin). Absorption was not corrected when the test was preceded by a five-day course of oral tetracycline in a dose of 1 g./day (82% faecal recovery of radioactivity), but complete correction was obtained when the test dose was administered along with 50 mg. of a preparation of hog intrinsic factor (29% faecal recovery of radioactivity).

The folic acid excretion test (Girdwood, 1960) was normal: the 24-hour urinary excretion after a subcutaneous dose of 5 mg. of pteroylglutamic acid was 3.5 mg. and after a 5-mg. oral dose of the same substance the 24-hour urinary excretion was 4.4 mg. (excretion index 126%). The oral glucose-tolerance test gave a result characteristic of partial gastrectomy with a rapid rise and fall in the blood-sugar levels. The serum-calcium level was 10.2 mg./100 ml., and the excretion of faecal fat estimated from a three-day stool collection with the patient on an ordinary ward diet was 28 g./day. An augmented histamine secretion test (Kay, 1953) revealed achlorhydria. Gastric and jejunal biopsies were performed by means of the Crosby small-intestinal biopsy capsule (Crosby and Kugler, 1957), and were reported as follows (Dr. A. Wynn Williams): "The gastric mucosa presents the features of chronic atrophic gastritis. Parietal cells are still present in places, but most of the glands are pyloric in type. There is marked elongation of the necks of the glands, and the surface epithelium shows hyperplastic 'tufting.' Intestinal metaplasia is also present. Inflammatory cells are not abundant in the stroma. The jejunal mucosa is normal, except for a mild degree of villous blunting in a few areas."

Barium-meal and follow-through examination, using a fine emulsion of barium, showed a normally functioning

Polya gastrectomy with normal transit of barium through the small intestine and a normal mucosal pattern.

Treatment and Progress

Cyanocobalamin therapy was begun on October 21 in an initial dose of 1,000 μg. daily for six days by injection. After six days the patient looked and felt much better, and the dose of cyanocobalamin was reduced to 1,000 μg. twice weekly. On October 29 treatment was begun with ferrous gluconate in a dose of 600 mg., together with 150 mg. of ascorbic acid. There was no reticulocyte response, presumably because of the relatively high level of haemoglobin at the beginning of treatment, but a repeat examination of the bone-marrow on November 23 showed normoblastic erythropoiesis, and on November 26 the haemoglobin level was 13.9 g./100 ml., the red blood count 4,810,000/c.mm., colour index 0.96, packed cell volume 48%, mean corpuscular volume 99 cubic microns, mean corpuscular haemoglobin concentration 28.9%. With the aid of physiotherapy the patient's disability slowly subsided, and on November 23 he remarked that he could again feel the ground under his feet. By December 4 the papillae on the tongue had reappeared. When the patient was examined as an out-patient on January 19, 1960, his cerebration was much improved, and, although the left plantar response was still extensor, there was no residual sensory impairment. There was marked improvement in his balance, although he still walked with rather a stamping gait and on a slightly wider base than normal. Romberg's test was negative. Faecal-fat excretion at this time still remained elevated at 28 g./day.

Discussion

The occurrence of S.C.D. in a known Addisonian megaloblastic anaemia has been reviewed by Richmond and Davidson (1958). Any disorder which gives rise to vitamin-B_{12} deficiency may produce this condition, but such disorders are usually confined to the stomach or small intestine, or both. It is therefore essential to exclude impaired absorption of vitamin B_{12} due to small-intestinal disease before accepting the gastric lesion as the sole cause of vitamin-B_{12} deficiency in this patient. It has been suggested that after partial gastrectomy of the Polya type the duodenal stump might act as a large diverticulum (Ogg, 1959) or stagnant loop harbouring coliform organisms and give rise to megaloblastic anaemia, but this theory has not been well substantiated, and in this case the absorption of cyanocobalamin did not return to normal after a five-day course of tetracycline. We cannot, of course, be certain that a stagnant loop was not present prior to the division of the adhesions which were responsible for producing the small-intestinal obstruction. The patient had increased faecal excretion of fat, but there was no other evidence of malabsorption.

In a group of nine patients described by Doig and Girdwood (1960) after partial gastrectomy three had an average daily faecal excretion of fat exceeding 20 g., but one had pancreatitis and one had diabetes. In four of the remaining six patients the daily excretion of fat exceeded 7 g. Badenoch *et al.* (1955) described six cases of megaloblastic anaemia which followed gastric operations, and three had mild steatorrhoea, with no other absorption defects. Shiner (1959) and Joske and Blackwell (1959) consider that partial gastrectomy may occasionally trigger off symptoms in a patient with "latent" idiopathic steatorrhoea, and these latter workers have demonstrated atrophic jejunitis in three out of four cases of steatorrhoea after partial gastrectomy. Shiner (1959), however, in a group of 15 such cases, found that only one had partial villous atrophy, the remaining 14 patients having a normal mucosa, but in a group of 23 patients suffering from idiopathic steatorrhoea the same author found mucosal abnormalities in every instance.

In our patient the jejunal mucosa was normal, and this suggests that the steatorrhoea was due to some mechanical or secretory malfunction produced by surgery, rather than to the presence of a "latent" idiopathic steatorrhoea. Moreover, if the impaired absorption of cyanocobalamin had been due to small-intestinal disease, little or no improvement would have been expected with the simultaneous administration of 50 mg. of hog intrinsic factor (Callender and Evans, 1955). Radiological examination showed no evidence of disease of the small bowel, including the lower ileum, which is thought to be the site of vitamin-B_{12} absorption.

There is considerable evidence, on the other hand, to suggest that the gastric lesion was responsible for impaired secretion of intrinsic factor which, in turn, had resulted in malabsorption of vitamin B_{12}. The patient was achlorhydric, and the impaired absorption of cyanocobalamin was fully corrected by intrinsic factor. Loewenstein (1958) showed that in a group of 33 patients 30 had normal absorption of ^{60}Co-labelled cyanocobalamin after partial gastrectomy: the time interval between the operation and the measurement of vitamin-B_{12} absorption ranged from one month to eleven years. The remaining three patients, who showed malabsorption, had undergone the operation at least six years previously.

Lous and Schwartz (1959) found that in a series of 51 patients in whom partial gastrectomy had been performed for duodenal ulceration, seven showed reduced absorption of vitamin B_{12}, whereas in a group of 45 patients who had been operated on for gastric ulceration 15 showed reduced absorption of vitamin B_{12}. The extent of the resection did not appear to be decisive. From these findings it would appear that severe vitamin-B_{12} deficiency is more likely to arise in the patient whose partial gastrectomy has been performed for gastric ulceration. The demonstration of atrophic gastritis in our patient suggests that this is the true cause of the condition. This is in keeping with the views of Doig and Girdwood (1960). Joske *et al.* (1955) showed that in 68% of patients who had undergone previous gastric surgery some degree of gastritis was present on histological examination of the biopsy specimens, and the interval of time between surgery and biopsy did not influence the incidence of gastritis. Moreover, in 65 biopsies from cases of proved gastric ulcer and 98 cases of proved duodenal ulcer severe atrophic gastritis was present in 29.2% of patients with gastric ulcer as against 5.1% of those with duodenal ulcer.

There was evidence of iron deficiency in our patient, and it is probable that the body stores were severely depleted. Iron deficiency has been claimed by some workers (Badenoch *et al.*, 1957; Cox *et al.*, 1959) to give rise to impaired secretion of intrinsic factor with reduced absorption of vitamin B_{12}, and this may have been an added factor in the production of vitamin-B_{12} depletion in this instance.

The biological half-life of vitamin B_{12} in the liver is considered to be approximately one year (Schloesser *et al.*, 1958), and it is therefore not surprising that Paulson and Harvey (1954) have shown that, after total

gastrectomy, as long as seven years may elapse before development of megaloblastic anaemia. It took 10 years before evidence of frank vitamin-B_{12} deficiency occurred in our patient, in whom some secretion of intrinsic factor was almost certainly present immediately after the operation. The time interval is of the same order as in the two cases described by Rowlands and Simpson (1932), the symptoms in these cases developing 6 and 15 years after the operation.

Summary

A case is described of subacute combined degeneration of the cord after partial gastrectomy for gastric ulceration in a man aged 32. Evidence is presented to show that the vitamin-B_{12} deficiency was consequent upon impaired secretion of intrinsic factor owing to the presence of chronic atrophic gastritis. Attention is drawn to the higher incidence of atrophic gastritis and malabsorption of vitamin B_{12} after partial gastrectomy for gastric ulceration as compared with that following this operation for duodenal ulceration.

We thank Dr. R. M. Murray-Lyon for permission to publish this case. We are grateful to Dr. A. Wynn Williams for his report on the biopsy material, and to Dr. R. H. Girdwood for his interest and advice.

References

Badenoch, J., Evans, J. R., and Richards, W. C. D. (1957). *Brit. J. Haemat.*, **3**, 175.
—— —— —— and Witts, L. J. (1955). Ibid., **1**, 339.
Baird, I. McL., Blackburn, E. K., and Wilson, G. M. (1959). *Quart. J. Med.*, **28**, 21.
Brit. med. J., 1959, **2**, 147.
Callender, S. T., and Evans, J. R. (1955). *Clin. Sci.*, **14**, 387.
Cox, E. V., Meynell, M. J., Gaddie, R., and Cooke, W. T. (1959). *Lancet*, **2**, 998.
Crosby, W. H., and Kugler, H. W. (1957). *Amer. J. dig. Dis.*, **2**, 236.
Doig, A., and Girdwood, R. H. (1960). In press.
Girdwood, R. H. (1960). *Scot. med. J.*, **5**, 10.
Heinle, R. W., Welch, A. D., Scharf, V., Meacham, G. C., and Prusoff, W. H. (1952). *Trans. Ass. Amer. Phycns*, **65**, 214.
Joske, R. A., and Blackwell, J. B. (1959). *Lancet*, **2**, 379.
—— Finckh, E. S., and Wood, I. J. (1955). *Quart. J. Med.*, **24**, 269.
Kay, A. W. (1953). *Brit. med. J.*, **2**, 77.
Loewenstein, F. (1958). *Blood*, **13**, 339.
Lous, P., and Schwartz, M. (1959). *Acta med. scand.*, **164**, 407.
Ogg, C. S. (1959). *Brit. med. J.*, **2**, 888.
Paulson, M., and Harvey, J. C. (1954). *J. Amer. med. Ass.*, **156**, 1556.
Richmond, J., and Davidson, L. S. P. (1958). *Quart. J. Med.*, **27**, 517.
Rowlands, R. A., and Simpson, S. L. (1932). *Lancet*, **2**, 1202.
Schloesser, L. L., Deshpande, P., and Schilling, R. F. (1958). *A.M.A. Arch. intern. Med.*, **101**, 306.
Shiner, M. (1959). *Proc. roy. Soc. Med.*, **52**, 10.

"A further example of prolonged research which in this year has progressed substantially towards a successful solution is provided by the Audible Playing Ball. All such balls so far developed have been based upon the concept of a hollow ball containing small objects, such as dried peas, which rattled as the ball was bounced. All suffered from the disadvantage that, when at rest, the ball ceased to sound. The new ball, at present undergoing intensive tests, consists of a small electronic sounding unit housed in sponge rubber within an outer casing. Powered by a miniature accumulator, rechargeable from a dry battery, this emits a bleeping sound continuously for up to ten hours on one charge. The built-in on/off switch is so designed as not to interfere with true bounce. Simple though such an object may appear to those with sight, it will fill a long-felt want in the lives of blind children and, it is hoped, enable them to add both cricket and football—those twin national pastimes—to the growing list of sports in which they now take part." (*Report of the Executive Council for the year ended March 31, 1959*, Royal National Institute for the Blind.)

PROLAPSED CORD

BY

S. A. SELIGMAN, M.B., F.R.C.S., M.R.C.O.G.

From the Institute of Obstetrics and Gynaecology, and Queen Charlotte's Maternity Hospital, London

The last 10 years have seen little change in stillbirth and neonatal death rates. Prolapse of the umbilical cord accounts for some of these deaths, and, as it is believed that prompt and adequate treatment would save many more of these potentially normal babies, it seemed worth while to report the results of treatment of 100 consecutive cases seen at Queen Charlotte's Hospital during the period 1951–9. The mode of death in such cases has been investigated by post-mortem examination and by experimental investigations into the role of arterial hypotension.

TABLE I.—*Incidence and Results*

	Total Cases	Prolapsed Cord	Incidence
Deliveries	25,885	100	0·4%
Stillbirths	589	19	3·2%
Neonatal deaths ..	461	9	2%

The overall results in this series are given in Table I, there being an uncorrected perinatal mortality of 28% with no maternal deaths.

Aetiology

Clinical

Numerous factors have been invoked as being of importance in the production of cord prolapse, including disproportion, hydramnios, surgical and medical induction of labour, low placental implantation, tumours, anaesthesia, and obstetrical manipulations. No correlation could be demonstrated with any of these conditions in the present series. The ratio of primigravidae to multigravidae was 45 to 55, this being a reversal of the ratio of total admissions over the same period. Only five patients had had more than four children. The factors which appeared to be of importance were as follows:

TABLE II.—*Mortality Associated with Presentation*

Presentation	Total No.	Stillbirths	Neonatal Deaths
Vertex	56	6	4
Breech	26	7	3
Oblique or transverse	10	4	1
Compound ..	6	2	1
Brow	2	0	0

Malpresentation.—The presentation in these cases is shown in Table II. Of the cases in which the vertex presented, the head was not engaged in nine; thus the head was presenting and engaged in only 47% of cases. It is also of interest that of the 26 cases in which the breech presented the legs were flexed in all except two.

Birth Weight.—The baby weighed 5½ lb. (2,495 g.) or less in 32 cases. Fifteen deaths occurred in this group, including all 10 babies weighing 3½ lb. (1,590 g.) or less. In three cases the baby weighed 10 lb. (4,535 g.) or more, and all three died. Of the 65 remaining babies, between 5½ and 10 lb. (2,496 and 4,535 g.), 10 died in the perinatal period.

Multiple Pregnancy.—There were 14 cases of twin pregnancy in the series. During the period under consideration there were 400 twin pregnancies altogether,

prolapse of the cord occurring in 3.5% of these cases. One foetus was dead on admission in a case of locked twins. All the others were live-born, but one subsequently died, its birth-weight being 2 lb. (907 g.). The baby was premature in six cases, and a malpresentation was present at the time of prolapse in eight cases.

Experimental

Until recently no experimental work had been done on this condition, and the views of Heinisch (1955), based on his experimental observations, are of interest. Prolapse of the cord can occur only when the presenting part fails to fit snugly into the surrounding maternal tissues, as when there is a malpresentation, in the absence of the so-called sealing of the lower segment. This obviously cannot be the whole story or the condition would be far more frequent than it is. Heinisch purported to show that the cord remains tense and coiled in the upper part of the uterus, while the pressure within its arteries remains within normal limits. This was done by injecting fluid under measurable pressures into the umbilical vessels. The experiment was performed with the cord immersed in a jar of fluid of appropriate specific gravity representing the uterus and amniotic fluid. Membrane rupture was stimulated by allowing the fluid to escape through an opening in the bottom of the jar, and before raising the umbilical arterial pressure this resulted in prolapse of the cord through the opening. When the pressure was raised to within normal limits the tense cord did not descend on releasing the fluid. If the fall in blood-pressure is the primary reason for cord prolapse, then the foetus is already at risk when this occurs. This concept is obviously an important one in regard to the mechanism of prolapse and its outcome to the foetus, so the experiment was repeated. Heinisch's findings were confirmed, but the experimental conditions were quite different from those *in vivo*. Because of arterial spasm in the severed cords it was quite impossible to run fluid into the arteries until the spasm had been overcome by raising the pressure of the entering fluid to 40 mm. Hg, when a column of fluid was forced along the vessels, the cord coiling and tensing with the passage of the fluid. Increasing the pressure increased these phenomena and produced shortening of the cord, so that the portion between the two fixed ends rose above its former level in a convincing Indian-rope-like manner which prevented experimental prolapse. These changes in the cord may easily be reproduced, without recourse to any special apparatus, by stripping the blood along a recently delivered cord from the placental end towards its clamped end, although here the changes are related to an increase of pressure within the umbilical vein and hence quite unrelated to normal conditions.

In order to stimulate conditions *in vivo* more closely, the spasm in the arteries of the freshly severed cords was abolished by the use of potassium cyanide solution, after which it became possible to run fluid through the umbilical vessels without recourse to pressure. The experiment was repeated, using these prepared cords, and it was found that the changes produced by the original method again occurred, but were more gradual in onset and took place over a greater range of pressure. The cords began to coil, shorten, and tense at approximately 40 mm. Hg, but to a less extent than the untreated cords. The changes increased progressively up to a pressure of 120 mm. Hg, but at 60 mm. were sufficient to prevent experimental prolapse. From this it would appear that prolapse of the cord is more likely to occur in a foetus which already has a lowered blood-pressure due to some pre-existing condition.

Treatment

The results of treatment are set out in Table III.

Caesarean Section.—One of the two deaths in this group was due to erythroblastosis foetalis; the other was associated with multiple congenital anomalies, the foetus dying *in utero* before the onset of labour, but vaginal extraction being impossible.

TABLE III.—*Treatment and Results*

Mode of Delivery	Total Cases	Deaths
Caesarean section	28	2
Forceps	37	8
Breech extraction	21	8
Internal version and breech extraction	4	2
Spontaneous	10	8

Forceps Delivery.—Of the eight perinatal deaths in this group, three were due to trauma.

Breech Extraction.—In three cases the foetus was dead on the mother's admission to hospital. In two cases death was traumatic in origin.

Internal Version and Breech Extraction. — This manœuvre was performed on three occasions in association with twin delivery. In one other case it was thought that the foetus would not survive the 10 minutes necessary to perform caesarean section, death in this case being traumatic.

Spontaneous Delivery.—In two cases intrauterine death had occurred before the onset of labour, and in a further case the cord had prolapsed before admission, by which time the foetus was dead. In one case death occurred in hospital before any active treatment could be instituted; in two others, where an attempt was made to replace the cord, this manœuvre was associated with immediate cessation of the foetal heart sounds. In one case the foetus was thought to be too small to survive, and in the remaining three cases the cord prolapsed when the cervix was fully dilated, spontaneous delivery following immediately; two of these babies were the survivors in this group.

Post-mortem Findings

Post-mortem examination was carried out in all 28 cases. There were three cases of intrauterine death before the onset of labour—one in association with a severe concealed accidental haemorrhage, and one with multiple congenital anomalies. Death was asphyxial in all three cases. Asphyxia was the commonest cause of death, accounting for 15 further cases in addition to the three above. In three instances the cause of death was given as previability, and there was one death due to erythroblastosis foetalis. The remaining six deaths were due to trauma at delivery.

Discussion

The incidence of prolapse of the umbilical cord varies from 1 in 74 to 1 in 1,018 deliveries (Slate and Randall, 1956). It appears to be decreasing with higher standards of obstetrics and the lowered incidence of contracted pelvis (Ahlgren, 1958). The perinatal mortality in most

of the published series is around 50%, but is lower in some: 36.4% (Myles, 1959) and 35.3% (Brandeberry and Kistner, 1951). Some other series have a lower mortality but are selective in that smaller foetuses have been excluded. The series by Cox (1951) is unique, the stillbirth rate being 11.4% in 35 cases, with no neonatal deaths. He is of the opinion that in urban communities with a highly efficient hospital service the child can be saved in almost every case. From the present series this appears to be an optimistic assessment of the foetal prognosis, there being a number of cases in which the foetus will be dead before prolapse occurs or where death will follow owing to some other factor, as in very small babies. These factors may not show in a selected series of cases, especially where the numbers involved are small; but no doubt many babies die who might be saved by better methods of treatment.

In some cases death is due to trauma associated with delivery, and in others to factors not directly associated with the prolapse. In most cases death is due to anoxia, relative to cessation of circulation in the umbilical vessels which is generally ascribed to pressure, the cord being compressed between the presenting part and the maternal tissues; this, however, seems unlikely in many cases where prolapse is anatomically possible, especially where the lie is not longitudinal, and is obviously not so in many patients examined at the time of prolapse. Rhodes (1956) believes that cessation of circulation in the umbilical cord is due to spasm, quoting experimental evidence by Barcroft (1946). This view seems likely, especially when taken in conjunction with the experiments described above. In addition, Rhodes believes that manipulation and cooling of the cord are added factors producing spasm and thus killing the foetus.

The blood-pressure in the umbilical arteries at term in the human foetus has been found by Barcroft (1946) to be 64–110 mm. Hg. Barcroft (1952) has also shown that there is a gradual rise in arterial pressure as intrauterine development proceeds, comparable figures in the sheep foetus being 38 mm. Hg at 120 days and 56 mm. Hg at 147 days. This in conjunction with the above experimental findings explains why prolapse of the cord occurs more often in the premature than in the mature foetus.

In order to reduce the foetal loss it is important to discover the actual mode of death in these cases, yet this has been neglected in previous series. In the present series no fewer than six of the 28 deaths were due to trauma. Although immediate delivery is indicated in these cases, even more care than usual must be taken, since the foetus is already in a precarious state and degrees of trauma which do not affect the healthy foetus may be sufficient to jeopardize its existence.

It is significant that, excluding the case of intrauterine death and the erythroblastotic foetus, the baby survived in every case submitted to caesarean section. Although some deaths in the remaining cases were due to trauma, the more usual mode of death was asphyxial. It is probable that the handling and manipulation of the cord necessary when performing vaginal delivery in these cases produces spasm in the umbilical vessels of a foetus already at risk, accounting for some of the deaths.

In the 10 cases where the baby weighed 3½ lb. (1,590 g.) or less there were no survivors. Although caesarean section was not performed in this group it seems unlikely that it has a real place in the treatment of cord prolapse of the very small foetus. Myles (1959) did not find any essential difference in mortality rates between babies weighing more than 5½ lb. (2,495 g.) and those weighing less, but does not state how many were substantially below this limit. All babies weighing 10 lb. (4,535 g.) or more died, but this number is too small to determine whether this is of any significance.

To achieve and improve upon the comparatively low perinatal mortality rate of this series it is necessary to have adequate facilities, so that caesarean section or any other treatment can be performed within 15 minutes of the diagnosis of prolapse of the cord. Early diagnosis by routine vaginal examination at the time of membrane-rupture will still further reduce the time-lag between occurrence and the institution of treatment.

Summary

One hundred cases of prolapse of the umbilical cord have been analysed and the aetiological factors and methods of treatment assessed.

The important predisposing factors are malpresentation, prematurity, twin pregnancy, and multiparity.

Caesarean section is superior to all other methods of treatment.

The recent improvement in the results of treatment in these cases is confirmed, but the claim that the child can be saved in almost every case is disputed.

The concept of lowered foetal blood-pressure as an aetiological factor in the occurrence of prolapse of the umbilical cord has been confirmed, and is advanced as the reason for the relative frequency of this condition in the premature foetus.

I thank the Medical Committee of Queen Charlotte's Hospital for permission to publish these results, and Professor J. H. M. Pinkerton for encouragement and help with this paper. I also acknowledge the part played by the various members of the medical and nursing staffs in the care of the patients, and by the pathology department in providing the post-mortem examination findings.

References

Ahlgren, M. (1958). *Acta obstet. gynec. scand.*, **37**, 526.

Barcroft, J. (1946). *Researches on Pre-natal Life*. Blackwell, Oxford.

—— (1952). In Marshall's *Physiology of Reproduction*, 3rd ed., vol. 2, p. 398, edited by A. S. Parkes.

Brandeberry, K. R., and Kistner, R. W. (1951). *Amer. J. Obstet. Gynec.*, **61**, 356.

Cox, L. W. (1951). *Lancet*, **1**, 561.

Heinisch, H. M. (1955). *Gynaecologica (Basel)*, **139**, 370.

Myles, T. J. M. (1959). *J. Obstet. Gynaec. Brit. Emp.*, **66**, 301.

Rhodes, P. (1956). *Proc. roy. Soc. Med.*, **49**, 937.

Slate, W. G., and Randall, J. H. (1956). *Amer. J. Obstet. Gynec.*, **72**, 991.

"One of the most pathetic forms in which sickle cell disease may present is the tearful mother, who comes with a sick child, whom she describes as suffering from a disease similar to one which has already stolen many of her children. If one may digress a bit, I should like to express my belief that the widespread Ibo belief in Ogbanje—that is, the concept of children who come to the world again and again only to die, breaking their parents' hearts with a sadistic regularity—probably arises from the widespread existence of sickle cell anaemia, and suggests that the disease must have been with our ancestors for many generations. There is, of course, another disease which could present such a picture, and that is Rh haemolytic disease of the new-born, which for some unknown reason and in total defiance of the laws of immunity is fortunately rare in Nigeria." (Dr. C. Nwokolo, *West African Medical Journal*, October, 1960.)

TOXIC MARROW FAILURE AFTER TREATMENT OF CARCINOMA WITH CYTOTOXIC DRUGS

BY

IAN CAMPBELL CREE, M.B., F.R.C.S.

Registrar, Wanstead Hospital, London; lately Locum Registrar, West London Hospital

Dissatisfaction with the results of surgical treatment in cancer, combined with increasing success in the use of cytotoxic drugs, has led to the adoption of the latter form of treatment by an increasing number of surgeons in recent years. Great impetus was given to this movement by the report of Watson and Turner (1959), which showed that marked objective improvement was obtained in 30 out of 34 cases of breast cancer treated with thiotepa alone or with thiotepa and testosterone. These workers advocated a trial of surgery and chemotherapy for early breast cancers and described their preliminary results.

A similar trial was begun at the West London Hospital by Mr. Grant Batchelor. Eleven cases of carcinoma of the breast have been treated by a course of testosterone and thiotepa after simple mastectomy or wedge excision of the primary carcinoma. At the time of writing three cases were in the ward, two having completed one course. Three cases were treated with mannomustine ("degranol") and testosterone when thiotepa was not available. With the exception of one case awaiting a second course, a favourable response has been obtained in all 17 cases to date.

While the final verdict on this form of treatment must await a five-year or even a ten-year follow-up, the disappearance of skin metastases, the complete clearing of pleural effusions, and the relief of pain in bone metastases, combined with a remarkable improvement in the sense of well-being in stage IV cases, has been most encouraging. In stage III cases fixed lymph nodes have melted away and in no stage has there been any evidence of recurrence at the site of excision of the growth or in the simple mastectomy scar.

The six pre-menopausal cases were also treated by oophorectomy. The treatment was well tolerated, and the only important side-effect encountered was toxic damage to the bone-marrow. It is with regard to the prevention and treatment of this grave complication, which is likely to arise in the treatment of any form of cancer with cytotoxic agents, that this paper has been written.

Toxic damage was encountered in five cases, all of which recovered. Such damage was evidenced by a fall in the white-cell count to below 3,000/c.mm., with a corresponding fall in the platelet count to 100,000/c.mm. or less. The haemoglobin fell to 60–70% of normal. Three of these cases had bone metastases, one had fixed axillary nodes, and one was classified as stage I but had extensive destruction of the breast.

Patients received 200 mg. of testosterone propionate intramuscularly daily for five days a week, for five weeks. Thiotepa (triethylene thiophosphoramide) 30 mg. intramuscularly was given on alternate days for a total of nine doses.

The white-cell and platelet counts were repeatedly checked. In only one case (No. 1 below) was the toxic marrow damage accompanied by a serious complication—severe haemorrhage.

The clinical course and haematological changes in two cases are recorded in detail.

Case 1

On February 29, 1960, a wedge excision of a stage III carcinoma in the breast of a woman aged 65 was carried out. She was given a course of testosterone propionate and thiotepa, and the white-cell count fell to 4,400. The ninth dose was omitted, as experience had shown that a fall in the white-cell count below 4,500 should be treated with caution. Two days later it rose to 5,800, and the patient was discharged to the out-patient department.

Ten days later she was readmitted suffering from severe epistaxis followed by melaena. She was shocked, and was given 1 pint (570 ml.) of packed cells after the nasal bleeding had been arrested by packing. The haemoglobin was 53% (7.6 g./100 ml.), clotting-time 3 minutes, and bleeding-time over 15 minutes; the white cells numbered 800, and the platelet count was very low.

Next day 2 pints (1.14 l.) of fresh donor blood was given. A day later the nasal pack was removed, but four days after this the epistaxis recurred and the nose had to be repacked. A further pint (570 ml.) of fresh donor blood was given one week after admission.

The white-cell count had remained at 800 (polymorphs 30%), with platelets down to 98,000 and bleeding-time 5 minutes 20 seconds. Arrangements were then made with Dr. H. E. M. Kay, of the Royal Marsden Hospital, for an infusion of fresh foetal haemopoietic tissue (liver suspension), while the result of a final pre-infusion white-cell count was awaited. The latter showed a rise to 1,000. Accordingly the infusion of foetal cells was not given. The white-cell and platelet counts rose steadily to 5,600 (polymorphs 65%) and 198,000/c.mm. respectively. Haemoglobin was 67% (9.8 g./100 ml.). There was no recurrence of either epistaxis or melaena, and the patient was discharged.

A course of tetracycline was given throughout the second admission, and a pyrexia of 103° F. (39.4° C.) which developed three days after admission subsided completely six days later, immediately after the second transfusion with fresh donor blood. The patient complained of a transient sore throat, but no objective evidence of inflammation was seen, and the throat swab grew no pathogens on culture.

Case 2

In April, 1959, a woman aged 77 was treated by left simple mastectomy for a carcinoma involving the axillary and supraclavicular glands with brawny swelling of the arm. She was subsequently given a course of radiotherapy.

The tumour had been present for two years and had ulcerated through the skin six months before admission. She remained well until February, 1960, when she developed pain in the left buttock and thigh that made walking difficult. *X*-ray examination revealed metastases in the pelvis with fractures of the iliopubic and ischiopubic rami. Hard nodules were found in the mastectomy scar, and there was a hard fixed gland in the right axilla.

A course of testosterone and thiotepa was given, but as the white-cell count fell to 3,800 after the seventh dose the drug was discontinued. The white-cell count continued to fall, being 1,000 21 days later; but after a further 12 days it had risen to 4,800, with 155,000 platelets, and the patient was discharged. She was walking completely free from pain and was feeling well. She had suffered no ill consequences from the marked fall in her white-cell count.

Discussion

These cases show one feature in common—a delayed but pronounced fall in the white-cell and platelet counts with a slow spontaneous recovery. The

remarkable fall in the white-cell count which gradually occurred over a period of three weeks in Case 2 emphasizes the importance of caution in dosage when the white-cell count falls below 4,500, while the unexpected delayed fall in Case 1 indicates the importance of weekly white-cell and platelet counts for the first few weeks after the cessation of treatment. These counts may be carried out in the out-patient department.

Experience suggests that, with careful dosage and control by regular haematological investigations, severe degrees of marrow damage can be avoided. The remarkable powers of recovery of the bone-marrow have been shown in all five cases of toxic damage in this series.

In the event of severe marrow damage, three possible lines of treatment are now available: (1) Repeated transfusions with fresh donor blood while awaiting spontaneous recovery of the bone-marrow. This procedure was successful in Case 1 and warns against too ready praise for the other lines of treatment which appear to be highly successful. Had the white-cell count in Case 1 remained low for 24 hours longer, great success would have been claimed for the graft of foetal cells planned. (2) Infusions of marrow from a donor. Homografts have been carried out successfully (Humble and Newton, 1958; Mathé *et al.*, 1959; Thomas *et al.*, 1959; Beilby *et al.*, 1960). Proved survival of the grafts was not longer than three to four months, except in the case reported by Beilby *et al.* in which the donor was a sister. In this case the donor cells were still present in a proportion of 40% in the blood nine months after infusion. Furthermore, this treatment carries the danger of "homograft disease" as described by Mathé and Bernard (1959). In view of this danger and the temporary nature of the grafts, they would be indicated only in very exceptional cases. (3) Infusions of foetal haemopoietic tissue as described by Bridges *et al.* (1960) employing liver and spleen suspensions prepared according to the method of Kay and Constandoulakis (1959).

Such infusions have been carried out successfully in a large number of cases (Kay, personal communication), but the grafts survive for less than a month. The tendency in the past has been to treat cases too hastily without awaiting spontaneous recovery in a damaged bone-marrow.

This method will probably increase in usefulness for selected cases with extremely severe marrow damage. Whether the benefit derived from adult and foetal homografts is due to the actual transplant of cells or to bone-marrow stimulants remains to be discovered.

Fresh donor blood may contain factors of great importance for haemopoiesis, as suggested by the improvement in Case 1.

Where it is desired to give a second course of cytotoxic agents, a strong case can be made for withdrawing the bone-marrow with a view to a possible subsequent autograft as described by Humble and Newton (1958) and Westbury *et al.* (1959).

Summary

Of the 17 cases of breast cancer treated with cytotoxic drugs and testosterone, five developed serious bone-marrow depression. Spontaneous recovery occurred in all cases, but one required repeated blood transfusions for severe haemorrhage. The danger of a delayed fall in the white-cell count and the likelihood of spontaneous recovery are pointed out.

I wish to thank Mr. Grant Batchelor for the material and data on which this report is based and for permission to publish.

References

Beilby, J. O. W., Cade, I. S., Jelliffe, A. M., Parkin, D. M., and Stewart, J. W. (1960). *Brit. med. J.*, **1**, 96.
Bridges, J. B., Bridges, J. M., Edelstyn, G. J. A., Lyons, A. R., and Nelson, M. G. (1960). *Lancet*, **1**, 629.
Humble, J. G., and Newton, K. A. (1958). Ibid., **1**, 142.
Kay, H. E. M., and Constandoulakis, M. (1959). *Brit. med. J.*, **1**, 575.
Mathé, G., and Bernard, J. (1959). Seventh European Congress of Haematology, London. Abstract No. 278.
—— Jammet, H., Pendic, B., Schwarzenberg, L., Duplan, J. F., Maupin, B., Latarjet, R., Larrieu, M.-J., Kalic, D., and Djukic, Z. (1959). *Rev. franç. Ét. clin. biol.*, **4**, 226.
Thomas, E. D., Lochte, H. L., and Ferrebee, J. W. (1959). *Blood*, **14**, 1.
Watson, G. W., and Turner, R. L. (1959). *Brit. med. J.*, **1**, 1315.
Westbury, G., Humble, J. G., Newton, K. A., Skinner, M. E. G., and Pegg, D. E. (1959). *Lancet*, **1**, 968.

A CASE OF TWIN ANENCEPHALIC PREGNANCY

BY

L. LEWIS, M.B., Ch.B., D.Obst.R.C.O.G.
Late House-Surgeon, Sorrento Maternity Hospital, Birmingham

Malpas (1937) gave the incidence of anencephaly in the general population as 0.3% and the incidence of recurrency of the malformation as 2.6%. Martin (1849) recorded the occurrence of six anencephalic births in the reproductive history of one woman.

Anencephaly in a twin pregnancy is rare. Ru-Kan Lin and Plenk (1955) recorded seven cases of twin pregnancy in which only one foetus was affected. They also described fully a case of twin pregnancy in which both foetuses were affected, the diagnosis being made *ante partum* by radiological means: this appears to be the first case in which the diagnosis was so made. Cases of twin pregnancy in which both twins have been found to be anencephalic have also been described by Josephson and Waller (1933), Dunn and Salter (1944, personal communication of a case encountered by Mr. Wilson Clyne), and Toulouse and Dubois (1957).

The following case is therefore thought to be rare enough to be put on record.

Case Report

A primigravida aged 25 with no past history of serious illnesses and with a regular menstrual cycle, 4/28 days, had her last menstrual period on March 10, 1959. Movements were first felt on August 7, 1959. Her blood was group O rhesus-positive. The Wassermann and Kahn reactions were negative. She was first seen in the antenatal clinic when 13 weeks pregnant. The size of the uterus was found to be consistent with the period of gestation. Physical examination did not reveal any abnormality.

She was next seen at this hospital when 22 weeks pregnant and was noted to have definite hydramnios. Abdominal girth measured 32 in. (81.2 cm.) and no foetal heart was heard. When seen at the antenatal clinic one week later her

abdominal girth was 32½ in. (82.5 cm.) and no foetal heart was heard.

An *x*-ray film of the abdomen in the antero-posterior diameter was taken. It was not very clear owing to the hydramnios, and only one anencephalic foetus was definitely seen, the fact that a second one was present being easily missed. At this stage it was therefore thought that there was only one foetus.

She was admitted to hospital on August 29. A Drew Smythe induction was performed next day and 49 oz. (1,390 ml.) of brown liquor was obtained.

The induction did not stimulate her into labour, and subsequently she had a "pitocin" drip, a re-stretch of the cervix, and dihydroergotamine methanesulphonate, 0.25 mg. intramuscularly three times at four-hourly intervals. She eventually started in strong labour on September 6 and the cervix became fully dilated at 2 a.m. on the 7th.

At 2.35 a.m. the first foetus was born—breech presentation. It was macerated, and showed characteristic signs of an anencephalic female monster. Abdominal examination revealed the presence of a second foetus in longitudinal lie. No foetal heart was heard.

At 3.05 a.m. a vaginal examination was made and the membranes of the second foetus were ruptured. A large amount of brownish liquid was again obtained. On withdrawing the finger the placenta of the first foetus was expelled from the uterus. The second foetus—male—was born soon afterwards, and also showed typical features of an anencephalic monster. The placenta of the second twin failed to separate and had to be removed manually under general anaesthesia. The puerperium was uneventful.

Discussion

An added interest of the case is that it was a binovular pregnancy. The pathogenesis of the condition is that it is an arrest in development of brain and spinal cord due to failure of closure of the neural tube posteriorly about the fourth week. The neural plate, by exposure to amniotic fluid at the cephalic extremity, became atrophic.

No obvious environmental causes were to be found. The patient was a young primigravida with no preceding history of infections, menstrual disturbances, anaemia, nutritional deficiencies, or exposure to possible chemical or physical dangers. The fact that the foetuses differed in sex is against the aetiology being due to derangement of sex chromosomes. There is no family history of this abnormality or of frequent associated abnormalities such as spina bifida, hydrocephaly, or Klippel–Feil syndrome.

Summary

A case of binovular twin pregnancy in which both foetuses were anencephalic is described.

There was no evidence to incriminate any environmental or hereditary factors in this case.

I thank Dr. J. Hallum for permission to publish this case and Dr. M. Israelski for use of the *x*-ray report.

References

Dunn, H. G., and Salter, J. G. (1944). *J. Obstet. Gynaec. Brit. Emp.*, **51**, 529.

Josephson, J. E., and Waller, K. B. (1933). *Canad. med. Ass. J.*, **29**, 34.

Malpas, P. (1937). *J. Obstet. Gynaec. Brit. Emp.*, **44**, 434.

Martin, J. (1849). *Med. Exam. (Philad.)*, **5**, 23.

Ru-Kan Lin and Plenk, H. P. (1955). *Amer. J. Roentgenol.*, **73**, 219.

Toulouse, R., and Dubois, J. (1957). *Bull. Féd. Gynéc. Obstét. franç.*, **9**, 617.

Medical Memoranda

A Case of Cryptococcosis of the Colon

The following case of cryptococcosis has some interesting peculiarities.

Case Report

A 16-year-old male student from Rize complained of diarrhoea that had persisted for several years. Eight years ago he started having watery, foamy stools, containing some mucus, about five times a day. During the last few years he had abdominal pains, tenesmus, and bloody stools in addition. During this period he had twice been admitted to hospital without any improvement. There was nothing noteworthy in his past or his family history.

Physical examination revealed a mass, the size of an egg and slightly painful on pressure, in the left colic region. The faeces contained mucus, blood, and ascaris eggs. On rectoscopy the rectum was found to be hyperaemic. Blood count: erythrocytes, 3,660,000; Hb, 70%; leucocytes, 5,200; sedimentation rate, 15 at the end of the first hour on December 15, 1958, and 24 on January 3, 1959. The urine was normal and the Mantoux test negative. *X*-ray examination showed normal lungs and some narrowing in the descending colon.

Surgical exploration revealed a hard tumour-like mass adherent to the mesocolon, located in the descending colon next to the splenic angle. The sigmoid was free, and numerous lymph nodes of various sizes were present in the mesocolon. After liberation of the tumour mass from the spleen and kidney, to which it adhered very firmly, an end-to-end anastomosis was carried out. A Pezzer catheter was placed in the colon and the retroperitoneal region was drained. On the fifth post-operative day watery faeces started to ooze from the catheter, which was removed on the tenth post-operative day. Recovery was uneventful, except for the formation of a fistula on the site where the catheter had been inserted; secretions from this fistula however, gradually stopped. Drug therapy consisted of sulphadiazine and "mysteclin."

The resected part of the colon, 22 cm. long, was cut open. The wall of the upper part was hardened and thickened (5–7 mm.) and the lumen was narrowed (2 cm. in diameter). The wall of the lower part was 3–4 mm. in thickness and its lumen 3 cm. in diameter. Though the mucosal folds were well identified in the thin part, they seemed to have been smoothed out in the thicker portion and replaced by eroded areas with pseudopolypous formations. The mucosa was in general very congested, infiltrated, and oedematous. The thickened lower portion contained flat nodular masses, 1.5 to 2 cm. thick, which on section showed soft pinkish and in certain parts myxomatous round foci, 0.5–1 cm. in diameter. These masses were located between hard, fibrous, and whitish-yellow areas. In the serosa of the thin portion of the colon were two small, hard nodes with grey sections, and one red and soft node the size of a lentil.

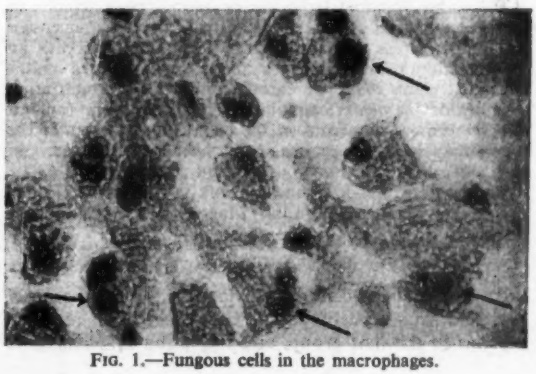


Fig. 1.—Fungous cells in the macrophages.

In the slides prepared from myxomatous masses of the serosa accumulations of histiocytes and, in some places, localized fatty tissue among bundles of collagenous fibres were observed. In the macrophage infiltrations there were a few lymphocytes, plasma cells, and, very rarely, polymorphonuclear leucocytes, but no giant cells.

Many macrophages (Fig. 1) contained one or, rarely, two round mycotic cells (Figs. 2 and 3), the size of a lymphocyte.

FIG. 2. — One intracellular fungous cell.

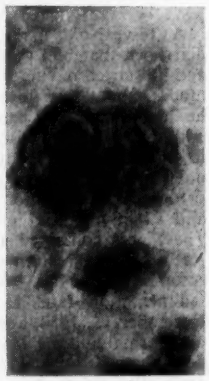


FIG. 3.—Two intracellular fungous cells.

Some of the fungous cells were surrounded by a clear transparent capsule. Extracellular fungous cells could be found with difficulty and only after a long search (Fig. 4). The diameter of the fungous cells was usually about 5–7 microns without the capsule and 7–10 microns with the capsule. Smaller cells, whose capsule could not be identified, were also observed. No mycelium formation was detected. When stained with haematoxylin and eosin the cytoplasm of the fungous cells was mainly pinkish grey, though some with grey-blue cytoplasm were also seen. The periphery of some cells was basophilic, and basophilic staining parts could be found. The capsules were very clearly visible in the slides stained with mucicarmine.

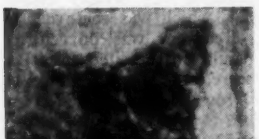


FIG. 4. — One extracellular fungous cell.

On account of the above-mentioned characteristics, which differentiate the fungous cells from *Blastomyces dermatitidis, Blastomyces brasiliensis, Coccidioides immitis, Candida albicans* and other *Candida* species, and *Histoplasma capsulatum*, it was concluded that the fungus observed was a cryptococcus.

The slides prepared from the pseudopolypous regions of the thickened wall of the colon showed fairly large ulcerated and eroded areas with little fibrin formation, but with an accumulation of macrophages and a few scattered multinucleated giant cells. A chronic inflammatory infiltration with histiocytes was present among the glands. The fungous cells were more numerous in the cell agglomerations of the serosa than in the macrophages of the ulcerated areas. In no giant cell was any fungous element found.

The regional nodes showed only characteristics of a sinusal inflammation, and no fungous element could be detected.

COMMENT

Cryptococcosis can be divided into two groups, localized and generalized. The case here reported belongs to the first group, and the lesion is localized to the descending colon. We could not find a case of similar location in the literature available to us. However, in generalized cryptococcosis mycotic elements can be detected in all tissues, including the intestines; for instance, in the first case of cryptococcosis reported from Turkey (Soysal, Unat, and Tahsinoglu, 1954) the parasites were detected in the lymphatic system of the intestines. In the present case no lesions attributable to cryptococcosis could be found either clinically or radiologically in any other part of the body.

In this case we are inclined to think that the portal of entry was the colon, though generally the respiratory tract, the skin, and the mucous membranes are considered the portal of entry (Littman and Zimmerman, 1956). Takos (1956) proved by experiments on monkeys that the digestive tract can be the site of primary inoculation. *Cryptococcus neoformans* was repeatedly recovered from soil (Emmons, 1951, 1955; Ajello, 1958) and milk (Carter and Young, 1950), besides normal skin and the gastro-intestinal tract of man (Benham, 1935).

Another interesting point in this case is the absence of gelatinous masses of free cryptococci and the rarity of giant cells. However, it has been known for a long time that cryptococci can be found in histiocytes. Baker and Haugen (1955), who studied the pathology of the disease in 26 cases, identified two principal types of tissue lesions. According to them, early lesions are gelatinous, while older lesions are granulomatous. These parasites are initially inert in tissues and form masses of fungous cells with but little surrounding inflammatory reaction; later they are phagocytosed by macrophages and giant cells. The course of the infection depends on the virulence of the strain and the resistance of the host. It has been proved that the thicker the capsule the more difficult the phagocytosis and the more virulent the strain of *Cryptococcus neoformans* (Drouhet, Segretain, and Aubert, 1950; Drouhet and Segretain, 1951). In our case we did not find fungous cells with very thick capsules, and this fact seems to explain their phagocytosis by histiocytes. While diarrhoea existed for eight years, it is difficult to claim that cryptococcosis was the cause from the very beginning, but it certainly accounts for the bloody diarrhoea during the last few years. It can be assumed that the resistance of the body and the colon was lowered by diarrhoea and thus the fungous cells, with limited pathogenicity, had a chance to penetrate and proliferate in the tissues without generalization.

We were unable to make cultures because the specimen had been fixed with formol.

EKREM K. UNAT, M.D., M.P.H.,
Director and Professor of the Institute of Parasitology, University of Istanbul.
BEDRETTIN PARS, M.D.,
Pathologist of the Cerrahpaşa Hospital, Istanbul.
J. P. KOSYAK, M.D., F.A.C.S.,
Attending surgeon of the French Hospital, Istanbul.

REFERENCES

Ajello, L. (1958). *Amer. J. Hyg.*, **67**, 72.
Baker, R. D., and Haugen, R. K. (1955). *Amer. J. clin. Path.*, **25**, 14.
Benham, R. W. (1935). *J. infect. Dis.*, **57**, 255.
Carter, H. S., and Young, J. L. (1950). *J. Path. Bact.*, **62**, 271.
Drouhet, E., and Segretain, G. (1951). *Ann. Inst. Pasteur*, **81**, 674.
—— —— and Aubert, J. P. (1950). Ibid., **79**, 891.
Emmons, C. W. (1951). *J. Bact.*, **62**, 685.
—— (1955). *Amer. J. Hyg.*, **62**, 227.
Littman, M. L., and Zimmerman, L. E. (1956). *Cryptococcosis torulosis*. Grune and Stratton, New York and London.
Soysal, S. S., Unat, E. K., and Tahsinoglu, M. (1954). *Arch. franç. Pédiat.*, **11**, 246.
Takos, M. J. (1956). *New Engl. J. Med.*, **254**, 598.

Reviews

FRACTURES

Fractures, Dislocations, and Sprains. By Philip Wiles, M.S.(Lond.), F.R.C.S.(Eng.), F.A.C.S. (Pp. 67; illustrated. 27s. 6d.) London: J. and A. Churchill, Ltd. 1960.

There is everywhere a growing recognition of the importance of efficient services for the treatment of injuries, whether the result of accidents in the home, in industry, or on the road. More than this, we recognize that the restoration of patients to their normal activities is very largely determined by the quality of treatment received at the beginning. This so often takes place in the casualty or accident receiving rooms and is in the hands of relatively inexperienced young surgeons.

For the latter Mr. Wiles has produced a masterpiece, admirably designed and succinctly written. It does not say all that a surgeon must know, nor does it give detailed accounts of surgical procedures. It does, however, state general principles and is profusely illustrated by a catholic collection of radiographs (excellently printed) with analytic line drawings. It informs the apprentice surgeon on all the varieties of injury to the bones and joints; on the pitfalls which they provide; and on the methods of treatment which are commonly followed to-day. Although not a voluminous work, there is room for Mr. Wiles's characteristic philosophy—such as "Rehabilitation is an overworked word, and something of a shibboleth." At first sight the book, which is slender and much broader than its height, would seem to be awkward for the bookshelf and impossible for the pocket. It should be in neither place, but on the desk of every casualty receiving room wherever English is spoken. It is not a crammer's text.

As suggestions for a second edition, which is likely soon to be required, one would like to see a short explanation of what is meant by a "functional position" or "position of rest," both of which terms are used. Also perhaps a revision of the illustration on page 4, taken from another author, in which reduction of a fractured femur is shown to be possible by first angulating the fragments to increase the deformity. The type of injury shown—a very oblique or spiral fracture—is not one most suitable for this manœuvre, which is generally more applicable to transverse fractures. We repeat: this is a masterpiece, and one gracefully dedicated to the author of another—Sir Reginald Watson-Jones.

NORMAN CAPENER.

PEPTIC ULCERATION

Peptic Ulceration A Symposium for Surgeons. By Charles Wells and James Kyle, M.B., M.Ch., F.R.C.S., F.R.C.S.I. Foreword by Lester R. Dragstedt. (Pp. 260+xi; illustrated. 42s.) Edinburgh and London: E. and S. Livingstone, Ltd. 1960.

Our knowledge and experience of common medical and surgical conditions changes so rapidly these days that new books on peptic ulcer can be written with reasonable justification every few years, and no longer can one book like Hurst and Stewart's dominate the scene for 20 years or more. This book is a product of the Liverpool School of Surgery, and is in fact an editored book with eight main contributors all experts in their field. Thus E. M. Backett deals with the epidemiology of peptic ulcer; Wilfred Sircus with aetiological considerations; R. B. Welbourn with delayed post-operative complications; and, naturally, Charles Wells deals with the principles of surgical treatment. Other chapters cover the clinical features and complications of peptic ulcer.

An unexpected and interesting feature of the book is an appendix with English translations of the early German contributions on gastric surgery. The book has a considerable surgical bias and is not nearly so well balanced as some other books on the same subject in recent years. Nevertheless, for those with a keen interest in this subject, and especially for practising general surgeons, there is much which can be read with profit.

F. AVERY JONES.

SYDENHAM'S THEME

Variations on a Theme by Sydenham: Smallpox. By P. B. Wilkinson, M.R.C.P. (Pp. 76; illustrated. 17s. 6d.) Bristol: John Wright and Sons, Ltd. 1959.

To-day it is unusual for a single doctor to have the opportunity for proper study of many of the patients involved in a large outbreak of smallpox. With effective quarantine control, and enforcement of other protective measures, the big outbreaks of the disease now occur chiefly among more backward peoples who are located in a difficult terrain far removed from the medical amenities enjoyed by more civilized communities. Necessarily under such primitive conditions these outbreaks must be dealt with by an overworked and numerically restricted personnel; detailed studies and photographic records are virtually impossible. Dr. P. B. Wilkinson's account of an epidemic of smallpox involving nearly 1,000 patients in Hong Kong in 1937–8, with which he was concerned, is therefore of much interest. Enlightened and enlivened by his own studies of much literature dating from the earliest records, the features of the disease in the many cases he saw during this particular epidemic are described in a clear and scholarly manner. Among the earlier writers on smallpox Thomas Sydenham stands out as a sound observer and great clinician, and his observations were made on patients he saw in an outbreak in London between 1660 and 1664. Dr. Wilkinson's own opinion of this remarkable man is implicit in the title of this small book, and he says that there is little to add to what Sydenham has written.

Among many other points of interest, the author vigorously rejects the concept of haemorrhagic smallpox as an entity. All smallpox is haemorrhagic, a tendency to haemorrhage being an outstanding feature of the disease. Both a toxaemic and a focal rash are characteristic of smallpox; the former is diffuse and is associated with severe constitutional disturbance. The onset of the disease is sudden and toxaemic in character; the fever is diphasic, the first stage being toxaemic, and the second due to the focal eruption and suppuration occurring in it. An exanthem usually is to be seen, commonly on the palate and fauces but often on the exposed mucosae. The exanthem is most profuse at points where the skin is exposed to pressure, chemicals, or other irritants. Toxic smallpox is the most rare and acute form, the patient always dying in the early toxaemic stage or in a recrudescence of

this state on the appearance of the exanthem. In confluent smallpox the focal exanthem is predominant and the mortality is up to 50%; it may be caused by a toxic myocarditis; discrete smallpox is the opposite in the extent of the exanthem, and in its mortality. Treatment is expectant; at the time of the epidemic "prontosil" was available and was valuable in the focal phase of the disease.

The book is extremely well illustrated with numerous admirable black-and-white photographs. An obvious defect is the absence of any bibliography, but in spite of this it is excellent as a work of reference on its subject matter.

A. R. D. ADAMS.

CORNEAL TRANSPARENCY

The Transparency of the Cornea. A Symposium Organized by C.I.O.M.S. Edited by Sir Stewart Duke-Elder and E. S. Perkins. (Pp. 268+xii; illustrated. 45s.) Oxford: Blackwell Scientific Publications. 1960.

The protective coat of the eye—the sclera and cornea—needs transparency in its anterior section and the cornea is classically regarded as histologically identical with the sclera except that its fibres are regularly laid down instead of the irregular pattern seen in the sclera. Repair in the transparent cornea produces a scar if damage extends deeper than the epithelium, and this scarring is again regarded as due to irregularly laid down fibres. As an opaque cornea is a potent cause of blindness, an understanding of the normal transparency of the cornea and of pathological opacification is an important clinical problem—all the more important as corneal grafts do not always remain clear even with the most adequate techniques.

The symposium reported in the present volume was a sort of extension of the last International Congress of Ophthalmology, when a number of workers on the subject attending the Congress met for a leisurely discussion on the various aspects of this work at the Belgian seaside. The contributors came from Greece, the United States, Sweden, Switzerland, Belgium, Italy, Israel, France, Holland, and Great Britain, and the discussion ranged over the whole field of the structure and function of the normal and pathological corneae. Contributions were both on laboratory work and on clinical observations. Useful observations also came from experts on corneal grafting. The symposium and the publication of its deliberations should help in furthering an understanding of this exceedingly difficult problem.

ARNOLD SORSBY.

PROBLEMS OF THE AGED

Health and Happiness in Old Age. By Celia Westropp, D.M., M.R.C.P., and Moyra Williams, D.Phil., B.Litt. (Pp. 133. 8s. 6d.) London: Methuen and Co., Ltd. 1960.

At a time when the problems of the infirm and sick section of our elderly population are attracting a lot of attention, among both the general public and the authorities in charge of the National Health Service and the National Assistance Acts, the appearance of this short book is both welcome and timely. The authors have worked for five years with the Nuffield Mental Health Research Team in the Geriatric Unit of the United Oxford Hospitals. In the course of their work they have collected a great deal of information and have, at the same time, acquired a wide experience in the management of the elderly sick, particularly from the psychological and mental health side of the problem. Many of the psychological changes that are to be found in the elderly can be prevented or treated successfully. One of the great problems at the present time is mental confusion, leading in time to a state of complete senility. The authors of this book explain how loneliness and a feeling of uselessness can contribute to the onset, or progress, of this distressing condition, but can give no definite preventive or curative measures. The day hospital plays an important part in keeping these patients as part of the community, but for many there comes a time when there is no alternative but admission to wards in a hospital especially designed for this type of patient.

This is a useful book, which can be studied with advantage by doctors and others who work for the elderly, as well as by any intelligent layman who wants to know something of the thorny problems confronting the elderly and those who care for them.

LORD AMULREE.

CRIMINAL ROOTS

The Roots of Crime. By Edward Glover, M.D., LL.D. *Selected Papers on Psycho-Analysis.* Volume II. (Pp. 422 +xiii. 45s.) London: Imago Publishing Co., Ltd. 1960.

Such an immense amount of information covering almost every aspect of delinquency is concentrated in this book that the vast experience of the author in this field is abundantly evident. Drawing upon his own writings and lectures, which cover a period of more than a quarter of a century, Dr. Glover has attempted to expound upon the subject of crime, so that his readers will be able to obtain an integrated picture of the subject, its relationship to the criminal himself, the judicial authorities, the medical profession, and the public. Naturally, as a psycho-analyst, he is particularly concerned with the problem of aetiology, and by such a study tries to delineate the roots of crime so that he remains true to the title of the book. It is clear that the work is intended for readers from various disciplines, including jurists, sociologists, and probation officers. To cater for so varied a group of workers, and to promote in them some understanding of such a complicated subject, is a formidable task which the author tackles with vigour and forthright clarity. Scattered throughout the book is a great deal of wisdom. There are also many times when one feels oneself in violent disagreement with what is stated. I think that this may be due to the fact that one is dealing with a subject the study of which is so much in its infancy that opinions tend to be coloured by one's own direct experiences. For example, the author states that most criminals start a psycho-therapeutic project in a state of negative transference and that during the therapy positive elements have to be discerned and fostered. In the experiences of the reviewer, the reverse is true. This may be due to the fact that criminals were seen and treated by him under different conditions from those under which Dr. Glover has worked, and that those conditions evoked different attitudes during the therapeutic process.

There are several themes which run through the book and are often interwoven with each other. The most important of these is the emphasis which is laid by the author on the role of the unconscious mind with its different and distinctive *modus operandi*. Only by means of deep and intimate understanding of the

unconscious processes which operate can the apparently irrational behaviour of criminals be understood and the contradictions in their attitudes and behaviour explained. This is where psycho-analytic psychopathology alone can offer a conceptual framework upon which to base present and future treatment and research. Another theme which runs through the whole book is the humanitarian plea for a more objective and realistic handling of the criminal so that tolerance and understanding can be exercised in the administration of a flexible penal code instead of the strange mixture of compassion and hostility together with fear and prejudice which contribute to the ataxia of our present social and legal handling of the criminal.

The psychopathology of crime and character structure of the criminal are dealt with on formal psycho-analytic lines, being related back to early relationships within the family constellation, and with particular emphasis being put upon the Oedipal situation. The author, while stressing the essential role of psycho-analytic knowledge and insight in the understanding of the criminal mind, is tolerant and well-disposed to non-analytic workers, but far less so towards psycho-analytic disciplines at variance with his own, which he regards as heretical, but which, in the opinion of the reviewer, are in touch with deeper layers of the unconscious mind and in the elucidation of which lies the way ahead. Nevertheless, these critical remarks are not intended to devalue the book, which, indeed, should be read by everyone interested in this subject.

A. HYATT WILLIAMS.

GUIDING PARENTS

The Mind of Your Child. By Doris Odlum, M.A., M.R.C.S., L.R.C.P., D.P.M. (Pp. 108. 4s.) London: W. and G. Foyle, Ltd. 1960.

For a medical specialist—and particularly a psychiatrist—to write a book of guidance for parents in the understanding of their children is a bold undertaking. Dr. Odlum has, however, done this, and done it most successfully. In language which can be understood by any educated parents she has described the developmental progress from the newborn period to adolescence, and gives much valuable practical advice on the handling of infants and young children and in the methods of preventing minor problems from becoming major psychiatric upsets.

This is a small book—less than a hundred pages of reading—and is divided into the consideration of eight age-periods between birth and 12 years of age. The last chapter deals with the social, moral, and spiritual values of the child; this section could, with advantage, have been expanded considerably. The main difficulty facing the author is to find the means of bringing her work into homes where it is most needed. Perhaps the tactful family doctor may help to achieve this end.

WILFRID GAISFORD.

MEDICAL HELMINTHOLOGY

Medical Helminthology. By J. M. Watson. (Pp. 500; illustrated. 84s.) London: Baillière, Tindall and Cox, Ltd. 1960.

Dr. Watson has produced a very useful piece of work in this book of nearly 500 pages, which was undertaken by him eight years ago. It is complete and competent, and an example of its thoroughness is seen in one of the appendices which covers recent advances in all branches of helminthology. There are numerous illustrations in black-and-white, many of them original, and the author has been generous in presenting information in tabular form and by diagrams.

The first part of the book contains, in 11 chapters, very readable and instructive accounts of general aspects of helminthology such as life cycles, ecology, transmission, immunology, physiology, pathology, distribution, and history. In the second part the nematode, cestode, and trematode parasites of man are presented systematically, but with a difference; instead of following the usual "zoological" procedure, the method has a distinct bias towards the viewpoint of the clinician. Within the broad classification into three main zoological groups the parasites are treated according to the organs or tissues in which their pathogenic stages normally reside. This section also deals with rarer forms of helminths of man and those which are not helminths in the strict sense—for example, the leeches and tongue-worms.

The numerous and varying techniques employed nowadays in helminthology are all very competently described in Part III, which also contains a table concerning differential diagnosis and an account of the various intermediate hosts of helminths. There are five appendices under the headings bibliography, zoological nomenclature, helminths of laboratory animals, "hairworms," and recent advances.

Students of helminthology, practitioners, and many others will find much of interest and practical value in this textbook, the scope of which makes it an important addition to helminthological literature.

J. J. C. BUCKLEY.

LOOSE BODIES

Osteochondritis Dissecans. Loose Bodies in Joints: Etiology, Pathology, Treatment. By I. S. Smillie, O.B.E., Ch.M., F.R.C.S.(Ed.), F.R.F.P.S. (Pp. 224+viii; illustrated. 60s.) Edinburgh and London: E. and S. Livingstone. Ltd. 1960.

There must be few people who have taken such interest and devoted so much thought to the fascinating group of conditions collectively known as osteochondritis dissecans. Mr. Smillie, in his latest monograph, has produced an excellent thesis on the subject which will be valuable to those who wish to gain more knowledge than ordinary textbooks provide. The work is based upon the author's personal experience and he quotes liberally from his own series of over 300 patients. He also refers amply to the world's literature on the subject.

There are three sections. The first deals generally with the condition and describes the author's views on its aetiology and classification. The remaining sections are divided into chapters concerned with individual joints and particular problems in each case. The section in which he describes his own technique and the results of open replacement of the loose fragment is particularly interesting.

Mr. Smillie regards ischaemia due either to injury or anomalies of ossification as the basic cause of osteochondritis dissecans, and considers that trauma is responsible for the localization and final development of the lesion. He distinguishes very aptly between anomalies of ossification, which are often mistaken for osteochondritis dissecans, but usually disappear by about the age of 12, and juvenile osteochondritis, which is the result of injury superimposed upon such anomalies.

The book is clearly written and frequent sub-headings help the reader to follow readily the author's line of

thought. The illustrations are excellent. The reproduction of radiographs and colour photographs in particular is an example of the high standard which all of us nowadays expect from E. and S. Livingstone, Limited. We recommend this book. Mr. Smillie has produced a stimulating work which is assured of a prominent place in every orthopaedic library.

D. R. SWEETNAM.
H. OSMOND-CLARKE.

CONGENITAL HEART DISEASE

Diagnosis of Congenital Heart Disease. A Clinical and Technical Study by the Cardiologic Team of the Pediatric Clinic, Karolinska Sjukhuset, Stockholm. By Sven R. Kjellberg, Edgar Mannheimer, Ulf Rudhe, and Bengt Jonsson. Second edition. (Pp. 866+xiv; illustrated. £10 3s.) Chicago: Year Book Publishers, Inc. London: Interscience Publishers, Ltd. 1959.

The second edition of this excellent book is welcome. Here is the best kind of team work, a closely knit and beautifully illustrated account of a fascinating subject by men working together in the Pediatric Clinic at the Karolinska Hospital. As the title indicates, it is concerned only with diagnosis, and this allows in 833 pages a degree of concentration denied to works on congenital heart disease as a whole. To readers working in the same field the gain is enormous.

Seven diagnostic tools are used consistently—clinical examination, phonocardiography, electrocardiography, roentgenography, electrokymography, cardiac catheterization, and angio-cardiography. In the third edition, it is hoped, indicator dilution curves will be added. Physical signs are more accurately described and interpreted than in the first edition. Phonocardiograms are used chiefly to illustrate auscultation and to serve as a time reference tracing for the interpretation of electrokymograms. The latter have been studied very carefully by Dr. Rudhe, and undoubtedly he has proved them to be more informative than generally believed. Although this may be partly attributable to the excellence of the recordings and partly to the simultaneous phonocardiograms, one suspects it is chiefly the result of Dr. Rudhe's own persistence. Perhaps electrokymography was abandoned too quickly in many clinics. Electrocardiography receives scant attention and little space, whilst vectorcardiography is scarcely mentioned and does not appear in the index. Even with so concentrated a target as this book aims at, there does not seem to be room for everything.

Cardiac catheterization and conventional roentgenography are adequately covered, but the honours go to the angiocardiographic sections. These are astonishingly good and the full interpretations very helpful. There is little doubt that the book will be valued highly and bought by many for the angiocardiograms alone; and this is saying a great deal, for even without them the book has a great deal to offer.

But why is there no index? Or are the authors and publishers under the impression that eight pages appended to 833 constitute an index? The 35 pages of references with full titles contrast oddly with this oversight.

This review, however, cannot end on a churlish note, for this is a first-rate book, comprehensive in its limited target, disciplined and streamlined in keeping to its objective, accurate, readable, and beautifully illustrated. It is highly recommended.

PAUL WOOD.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received.

Die Chirurgie Des Magensarkoms. By Professor Dr. A. Gutgemann and Dr. H. W. Schreiber. (Pp. 95+v; illustrated. DM. 28.50.) Stuttgart: Georg Thieme Verlag. 1960.

Lipoids and Blood Platelets with Reference to Blood Coagulation and the Hemorrhagic Diseases. By John H. Ferguson, M.D., D.Sc. (Pp. 278+xix; illustrated. 40s.) Chapel Hill: The University of North Carolina Press. London: Oxford University Press. 1960.

The Multilingual Manual for Medical Interpreting. By Louis R. M. Del Guercio, M.D. (Pp. 160.) New York: Pacific Printing Co., Inc. 1960.

The Plasma Proteins. Edited by Frank W. Putnam. Vol. II. ***Biosynthesis, Metabolism, Alterations in Disease.*** (Pp. 518+xv; illustrated. $14.50.) New York and London: Academic Press. 1960.

Untersuchung und Beurteilung des Herzkranken. Praktische Routineuntersuchung. Präoperative Herzdiagnostik. Funktionsanalyse für die Herzprophylaxe und Sporttherapie. Cor Pulmonale. By Professor Dr. H. W. Knipping, Professor Dr. W. Bolt, Dr. H. Valentin, and Dr. H. Venrath. Second edition. (Pp. 638+xxiv; illustrated. DM. 98.) Stuttgart: Ferdinand Enke Verlag. 1960.

Medical and Biological Research in Israel. Edited by Moshe Prywes. (Pp. 562+xix; illustrated. $8.) Jerusalem: Hebrew University of Jerusalem; Hadassah, the Women's Zionist Organization of America; Rubin Mass, Publisher. 1960.

Elektrolyt-Kompendium. Physiologie, Pathologie, Therapie des Wasser- und Elektrolythaushaltes. By Dr. Werner Fleischer and Dr. Ernst Fröhlich. (Pp. 388. Sw. fr. 38.) Basle, Stuttgart: Benno Schwabe and Co. 1960.

Nature Hits Back. By Macpherson Lawrie. (Pp. 190. 3s. 6d.) Kingswood, Surrey: World's Work (1913) Ltd. 1960.

Visual Aids in Cardiology: Diagnosis and Treatment. Edited by Arthur M. Master, M.D., and Ephraim Donoso, M.D. (Pp. 216; illustrated. $10.) New York and London: Grune and Stratton. 1960.

A Mount Sinai Monograph on Diagnostic Roentgenology of the Digestive Tract without Contrast Media. By Bernard S. Wolf, M.D., Mansho T. Khilnani, M.B., and Arthur Lautkin, M.D. (Pp. 180; illustrated. $8.75.) New York and London: Grune and Stratton. 1960.

Practical Birth-Control Methods. By Abraham Stone, M.D., and Norman E. Himes, Ph.D. English edition revised by Margaret C. N. Jackson, M.B., B.S., D.Obst.R.C.O.G., J.P. (Pp. 208; illustrated. 21s.) London: George Allen and Unwin, Ltd. 1960.

Behaviour Therapy and the Neuroses. Readings in Modern Methods of Treatment derived from Learning Theory. Edited by H. J. Eysenck, Ph.D. (Pp. 479+xi; illustrated. 63s.) Oxford, London, New York, Paris: Symposium Publications Division, Pergamon Press. 1960.

Differential Diagnosis of Yaws. By C. J. Hackett, M.D., F.R.C.P., and L. J. A. Loewenthal, M.D., M.R.C.P., D.T.M.&H. (Pp. 88; illustrated. 17s. 6d.) Geneva: World Health Organization. London: H.M. Stationery Office. 1960.

Lectures on Haematology. Edited by F. G. J. Hayhoe, M.A., M.D., M.R.C.P. (Pp. 246; illustrated. 60s.) Cambridge University Press. 1960.

The Pocket Prescriber and Guide to Prescription Writing. By Alistair G. Cruikshank, F.R.C.P.E. Seventeenth edition. (Pp. 307. 6s.) Edinburgh and London: E. and S. Livingstone, Ltd. 1960.

Outline of Fractures, Including Joint Injuries. By John Crawford Adams, M.D.(Lond.), F.R.C.S.(Eng.). Third edition. (Pp. 268+viii; illustrated. 27s. 6d.) Edinburgh and London: E. and S. Livingstone, Ltd. 1960.

Medicine for Nurses. By M. Toohey, M.D., M.R.C.P., D.C.H. Chapter on Psychological Medicine by Henry R. Rollin, M.D., D.P.M. Fifth edition. (Pp. 667+xvi; illustrated. 30s.) Edinburgh and London: E. and S. Livingstone, Ltd. 1960.

Disc Lesions and other Intervertebral Derangements, Treated by Manipulation, Traction and other Conservative Methods. By E. J. Crisp, M.D.(Cantab.), D.Phys.Med.(Lond.). (Pp. 158+viii; illustrated. 15s.) Edinburgh and London: E. and S. Livingstone, Ltd. 1960.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY NOVEMBER 19 1960

RENAL FAILURE AND THE ARTIFICIAL KIDNEY

Haemodialysis by an artificial kidney has proved to be a safe and valuable technique. It has been employed to treat patients poisoned with barbiturate, salicylate, bromide, and other drugs, but the main indication for its use is acute oliguric renal failure,[1] due usually to acute tubular necrosis, sometimes to acute glomerulonephritis and, on occasion, to cortical necrosis. The prognosis of uncomplicated acute oliguric renal failure due to acute tubular necrosis complicating pregnancy or medical (as distinct from surgical) conditions is good: survival may be expected in about 80% of cases and haemodialysis is required in only about half of them.[2] The prognosis of acute oliguric renal failure due to acute glomerulonephritis or cortical necrosis is much worse. The glomerular damage is often irreversible, and, if extensive, requires kidney transplantation, as yet an unresolved problem in cases of active glomerulonephritis even in identical twins. Haemodialysis has not a great deal to offer in such cases: it may be indicated as a prelude to renal biopsy when the diagnosis is in doubt and rarely before kidney transplantation.

The poor prognosis of acute oliguric renal failure which complicates surgical conditions is a different matter, for usually the kidneys are histologically indistinguishable from those seen in cases of acute tubular necrosis complicating pregnancy or medical conditions. The 47% survival rate reported by L. H. Smith and colleagues,[3] the result achieved by an American artificial kidney unit in Korea during the campaign there, has not been equalled in civilian practice in subsequent years. There may have been an unavoidable artificial selection of cases, since it is possible that not all military casualties, because of the circumstances, could be resuscitated to survive long enough to manifest acute oliguric renal failure. Whatever the explanation, the fact remains that the prognosis of acute tubular necrosis complicating surgical conditions in civilian practice at the present time is poor. L. W. Bluemle and colleagues[4] report a 74% mortality rate from Philadelphia, and J. E. Kiley and colleagues[5] a 65% mortality rate from Albany, New York. The latter team treated 80 patients with acute oliguric renal failure due to acute tubular necrosis; 40 followed surgical procedures, 17 followed accidental trauma, while 13 had an obstetric and 10 a medical origin. Haemodialysis was used in 48 of the 80 cases. The mortality rate in the obstetric and medical cases was only 9% and contrasted strikingly with the 65% mortality rate of the surgical cases. As the report by Mr. R. Shackman and his colleagues at p. 1473 of the *Journal* shows, an experienced team in Great Britain produces similar results.

American and British experience[4 5] has shown that significant factors affecting the course and prognosis include the presence of serious extrarenal lesions, poor wound healing, and infection. The uraemic state not only delays healing but also predisposes to infection.[4] Poor healing increases the risk of wound dehiscence and breakdown of gastro-intestinal suture lines, while infection accelerates the rate of protein katabolism, so that the daily increase of blood urea may be 100 mg. per 100 ml. or more, and repeated haemodialyses are required.

It is possible that better results in cases of acute tubular necrosis of surgical origin will be achieved by the use of more frequent, or even continuous, haemodialysis and the provision of special facilities to isolate the patient from infection. This, however, will entail increased expenditure of time and money and is as much an economic and administrative problem as medical. One thing is certain. Haemodialysis by an artificial kidney should be available to patients suffering from acute oliguric renal failure despite the fact that many of those with surgical conditions ultimately succumb.

[1] See *Brit. med. J.*, 1959, 1, 772.
[2] Loughridge, L. W., Milne, M. D., Shackman, R., and Wootton, I. D. P., *Lancet*, 1960, 1, 351.
[3] Smith, L. H., *et al.*, *Amer. J. Med.*, 1955, 18, 187.
[4] Bluemle, L. W., jun., Webster, G. D., jun., and Elkinton, J. R., *A.M.A. Arch. intern. Med.*, 1959, 104, 180.
[5] Kiley, J. E., Powers, S. R., and Beebe, R. T., *New Engl. J. Med.*, 1960, 262, 81.

VITAMIN-B_{12} NEUROPATHY AFTER GASTRECTOMY

Total gastrectomy may be followed by a megaloblastic anaemia due to deficiency of vitamin B_{12}. The explanation is that the operation removes all that area of stomach which secretes the "intrinsic factor" essential for the absorption of vitamin B_{12} from the small intestine. Patients who have had partial gastrectomies or one of the other operations that involve an anastomosis between stomach and jejunum develop megaloblastic anaemia much less frequently.[1] Recently A. Doig and R. H. Girdwood[2] reported on 10 patients who had developed megaloblastic anaemia after gastric operations, 9 of them between 1 year 2 months and 8 years after the operation and one 37 years after. Two of the 10

had had total gastrectomies, 8 had had partial gastrectomies. They all showed poor absorption of labelled vitamin B_{12}, and in all the absorption improved, often considerably, when intrinsic factor was given with the B_{12}. Four other patients who had symptoms of malabsorption after gastric operations were found to have poor absorption of vitamin B_{12}, but they had no clinical signs of B_{12} deficiency. All these reports show that gastric operations can be followed in some patients by a condition very like Addisonian pernicious anaemia. It might therefore be expected that a neuropathy like the subacute combined degeneration of the spinal-cord tracts classically associated with pernicious anaemia would also occur after gastric operations, but in practice the reports of such cases are rare even after total gastrectomy. In Doig and Girdwood's paper, for example, only one instance of peripheral neuritis is recorded, in a patient who had had a partial gastrectomy; but other clinicians have reported more definite cases.

In 1929 H. Dennig[3] reported the case of a man who, nine years after total gastrectomy, developed a macrocytic anaemia, sensory disturbances, and ataxia; his knee-jerks were absent, and at necropsy degeneration of the posterior columns of the spinal cord was found. In 1932 R. A. Rowlands and S. L. Simpson[4] reported two cases: one was a woman who had had a partial gastrectomy for six years and then developed a macrocytic anaemia with sensory disturbances, ataxia, and extensor plantar responses; she improved considerably on treatment with liver extract. The other patient was a man who had had a partial gastrectomy fifteen years before his neuropathy appeared with signs of sensory and motor-tract disease. Since these reports no more definite cases of subacute combined degeneration of the cord after gastrectomy have appeared. J. Richmond and Sir Stanley Davidson[5] in 1958 reviewed ten cases of this neuropathy in association with non-Addisonian megaloblastic anaemia and pointed out that five of the patients had steatorrhoea and five had structural defects of the small intestine; their own two patients also had diseases of the small intestine. They suggested that "vitamin B_{12} neuropathy" was a better name than subacute combined degeneration of the cord for neurological manifestations of B_{12} deficiency not connected with classical pernicious anaemia. The case reported in this issue of the *Journal* by Dr. J. D. Knox and Dr. I. W. Delamore at p. 1494 is therefore of much interest. They investigated their patient very thoroughly and took particular pains to exclude disease of the small intestine. The patient had had a Polya gastrectomy, removing three-quarters of the stomach, ten years before he was seen by them at Edinburgh. He had a mixed megaloblastic and iron-deficiency anaemia, and there were signs of impairment of motor and sensory function, including an extensor plantar response on one side. The serum level of B_{12} was low; a test dose of labelled cyanocobalamin was poorly absorbed; this was corrected by giving a preparation of intrinsic factor, but not by giving a course of tetracycline to correct any possible intestinal infection. The test for excretion of folic acid was normal. Excretion of faecal fat exceeded the accepted normal maximum of 7 g. a day, but capsule biopsy of the small intestine showed a normal jejunal mucosa, and good reasons are given for considering that the gastric lesion was responsible for the malabsorption of vitamin B_{12}. The patient was treated with cyanocobalamin, and after four months had improved considerably, though there was still some sensory loss and the excretion of faecal fat remained high.

The risk of megaloblastic anaemia and of possible neuropathy after the operation of total gastrectomy is now well appreciated, and patients subjected to this procedure are given regular parenteral cyanocobalamin afterwards. But it is less well known that there is a similar risk after partial gastrectomy. More of these cases seem to occur five years or even longer after the operation, when the patient may have ceased attending a follow-up clinic. Consequently the onus of watching gastrectomy patients for the onset of complications falls on the general practitioner. P. Lous and M. Schwartz[6] have shown that reduced absorption of vitamin B_{12} is commoner when the initial lesion is a gastric ulcer than when it is a duodenal ulcer, and this may well be due to a co-existent atrophic gastritis. So it is the patients who have had a gastrectomy for gastric ulcer who most need watching, and since the anaemia is so easily corrected, and the neuropathy prevented by treating a properly diagnosed anaemia, it is worthwhile to insist on a regular check, perhaps once a year.

[1] See *Brit. med. J.*, 1959, **2**, 147.
[2] Doig, A., and Girdwood, R. H., *Quart. J. Med.*, 1960, **29**, 333.
[3] Dennig, H., *Münch. med. Wschr.*, 1929, **76**, 633.
[4] Rowlands, R. A., and Simpson, S. L., *Lancet*, 1932, **2**, 1202.
[5] Richmond, J., and Davidson, S., *Quart. J. Med.*, 1958, **27**, 517.
[6] Lous, P., and Schwartz, M., *Acta med. scand.*, 1959, **164**, 407.

THE CONSULTANTS' VOICE

In 1948 the Royal Colleges, the Royal Scottish corporations, and the B.M.A. set up, under the chairmanship of the late Sir Lionel Whitby, an exploratory committee to devise a way of representing the interests of consultants and specialists in the National Health Service. The outcome was the Joint Consultants Committee. "It is essential," the exploratory

committee's statement[1] ran, "in the interests of consultants that a joint committee of the bodies concerned should be established to speak for consultants with one voice." It was agreed that this committee should have 17 members, of whom 11 should be appointed by the Royal Colleges and Corporations and 6 by the Central Consultants and Specialists Committee of the B.M.A., and two secretaries, one appointed by the Colleges and Corporations and one by the B.M.A. The proposed constitution allowed for disagreement among its constituents: "Where a constituent body disagrees with the view of the Joint Committee . . . [it] shall be entitled to have its view represented to the Government, provided that, before any such representation is made, a conference . . . is held in an endeavour to reach agreement." The exploratory committee suggested that it was "desirable" that there should be representation of both teaching and non-teaching interests in the representation of constituent bodies.

With the addition of two representatives of the British Dental Association, the constitution of the Joint Consultants Committee is the same to-day, and its members, appointing bodies, and terms of reference are given at page 212 of the *Supplement*. In another capacity its members act as the staff side of Committee B of the Medical Whitley Council. The six B.M.A. representatives are appointed by its Central Consultants and Specialists Committee, an autonomous body of between 70 and 80 members not necessarily members of the B.M.A. This Committee's function is to act on the Association's behalf for all hospital medical staff, and it is based broadly enough to do so.[2] Thirty-two of its members are appointed—two from each region—by regional consultants and specialists committees in England, Wales, and Northern Ireland; and the specialist groups, and the S.H.M.O. and Hospital Junior Staff Groups, are also represented on it. A similar arrangement holds in Scotland. The regional consultants and specialists committees are equally designed to represent all interests. "Membership," states the model constitution for these committees, "should be based upon the representation of the medical staff of each hospital group. . . ." Again, it states that the electorate should include, in addition to hospital staff, consultant and S.H.M.O. members of all other specialist units in the region and representatives elected by the regional registrars group.

On the B.M.A. side the machinery of democracy is there for those who want to use it. Behind its six representatives on the Joint Consultants Committee are impressive arrangements for keeping them informed of current opinion. Mr. H. H. Langston, the chairman of the Central Consultants and Specialists Committee, said at its last meeting (*Supplement*, p. 208) that its executive committee did not wish to press for any alteration in the constitution of the Joint Committee or the Staff Side of Committee B. It thought, however, that procedure "might well be improved in various directions," and the matter was being discussed within the Joint Committee. Mr. Langston was no more specific than that, and the outcome of these discussions must be awaited.

The Joint Consultants Committee since its beginning has ably fulfilled its peculiarly difficult task, embarking as it did on quite uncharted waters with no previous experience of the intricacies of medical politics. It would no doubt be the first to consider sympathetically any proposals which would enhance its ability "to speak for consultants with one voice" and at the same time increase the measure of confidence which the majority of those it represents already have in it.

But a letter in this week's *Supplement* from the president and secretaries of the Regional Hospitals' Consultants and Specialists Association calls attention to this organization's disquiet about the inadequate representation of non-teaching hospital consultants on the various bodies which control the affairs of the N.H.S. and the profession. They state that 85% of consultants and specialists work in regional board hospitals, but 53% of merit awards go to consultants in teaching hospitals. They complain that non-teaching hospital consultants on the councils of the Royal Colleges are negligible in number. Committees which deal with hospital staffing and consultant appointments are overweighted with those who lack experience of work in so-called peripheral hospitals. The burden of the complaint is that the bread-and-butter affairs of the majority of consultants and specialists, and also, it may be assumed, of hospital junior staff, are too much in the hands of a minority at the top. Unfortunately the replies to a questionary set out in the letter in support of this view are given only as percentages. There is no record of how many received the questionary and how many answered it. The extent of the dissatisfaction is therefore not known. But that it exists at all calls for examination, because one of the most notable achievements of the N.H.S. is the more even distribution of specialist and consultant skill throughout the country. If this is to be maintained, consultants and specialists at all points of the compass should have reasonable cause to be contented with their lot.

[1] *Brit. med. J., Supplement*, 1948, 2, 226.
[2] The Association's Organization for Consultants and Specialists. *B.M.A. Year Book*, 1960, p. 100.

LEGALITY OF STERILIZATION

Is it lawful to sterilize a consenting patient for other than grave therapeutic necessity? The law, both in England and in Scotland, is silent on the point. It is therefore a matter of opinion. Until now advice to the profession has been based on a joint counsel's opinion delivered to the Defence Societies in 1949.[1] This was to the effect that sterilization on eugenic grounds alone was illegal, but not sterilization done for valid therapeutic reasons. This put sterilization on a par with therapeutic abortion, and practitioners were advised, before operating, to avail themselves of safeguards similar to those they would require for a case of therapeutic abortion—namely, a second opinion, written consent, preferably from both spouses, and performance of the operation in circumstances without any shadow of concealment.

The correctness of the 1949 opinion is now strongly challenged. Through the courtesy of the Medical Defence Union and the Medical and Dental Defence Union of Scotland we print at p. 1516 summaries by our Legal Correspondent of two new opinions, one relating to English Law and the other to Scottish Law, both of which reverse the earlier view. A particularly distressing eugenic case, involving the transmission of the same serious hereditary defect to two consecutive children, recently prompted the Medical Defence Union to seek fresh advice on the legality of sterilization. They accordingly obtained a joint opinion on the English Law from leading and junior counsel. A joint opinion on the Scottish Law was subsequently obtained by the Medical and Dental Defence Union of Scotland.

Very briefly indeed, the English opinion concludes that an operation for sterilization is not unlawful whether it is performed on therapeutic or eugenic grounds or for other reasons, provided there is full and valid consent to the operation by the patient concerned. It is admitted, however, that this interpretation has no direct judicial authority to back it, as the issue has never been tried. The first case to come to court would be a test case. And, although counsel believe that the courts would uphold the legality of such sterilization, they make it abundantly clear that the particular merits of this first case might well prove an important deciding factor. As our Legal Correspondent puts it, "The pitfalls are numerous and any aspirant hero would be well advised to take careful advice on the particular facts before operating." The Scottish view is summarized thus: "If a sterilization operation were performed with the full consent of the patient by a responsible surgeon and if the reason for doing it was substantial and not obviously immoral by present-day standards, it is exceedingly improbable that the court would hold the act to be criminal."

How is the situation changed? The law is unaltered. It remains as inscrutable and unsatisfactory as before. The only change is that now learned counsel give it as their opinion—and it is only an opinion—that with certain safeguards sterilization is not a crime. This of course includes eugenic sterilization. Only a few uncommon diseases, however, are known to result from the transmission of a hereditary defect. In these rare cases it would seem unlikely that the law would hold a doctor to have acted criminally in meeting the request of a married couple for sterilization. But how far beyond this would sterilization be considered permissible by the public conscience even if legal safeguards were fully met? And if the law were to declare sterilization to be legal, then how is the doctor to act when it is demanded by a patient in what the patient believes to be his or her own interest?

There can be no easy answer to these and many other questions that will arise. Quite apart from the teachings of various religions there are ethical codes governing the practice of medicine. These differ in detail and in strictness of application in different countries. The World Medical Association formulated some twelve years ago a code that has been accepted by the doctors of many countries throughout the world. In its International Code of Medical Ethics, the W.M.A. declared: "A doctor must always bear in mind the obligation of preserving human life." It is not easy to state categorically just where this obligation begins and ends. But as the preservation of human life, it could be argued, is bound up with the preservation of the human species, with the maintenance of society, then this part of the code could by extension of meaning include such a conclusive act as sterilization.

It is desirable that the ambiguities of the law should be resolved. But this is only a part of a question to which society itself must find the answers. The Law, the Churches, informed public and medical opinion, must all be brought to bear on a matter which in its implications goes far beyond the few rare cases in which the medical indications can be clearly defined.

[1] The Medical Defence Union. *Annual Report*, 1949, p. 14.

HUMIDITY AND TRANSMISSION OF VIRUSES

Three Dutch workers[1] have just reported the results of spraying into closed chambers suspensions of poliomyelitis and of influenza virus. The mean size of the droplets was 6 μ and the suspending fluids contained some organic materials, so that the virus particles should not have been unnaturally labile. The effect of changes in relative humidity on the two viruses was astonishingly different. Poliomyelitis died off almost instantly in the drier atmosphere but was relatively stable at a relative humidity of 50% or higher. Influenza behaved in a precisely contrary manner: below a relative humidity of 40% it was fairly stable, but quickly perished when the relative humidity was high. The authors point out that the relative humidity indoors is high during the summer months, when poliomyelitis prevails, and covers the range where that virus survives in the air most readily. Conversely the 'flu-ridden winter months have a low indoor humidity, most favourable for survival of the influenza virus. There is dispute about the relative importance of the

[1] Hemmes, J. H., Winkler, K. C., and Kool, S. M., *Nature (Lond.)*, 1960, 188, 430.

[2] Hope Simpson, R. E., *Roy. Soc. Prom. Hlth J.*, 1958, 78, 593.

respiratory and intestinal routes in transmission of poliomyelitis. But, even if faeces are an important source of infection, there are several ways in which virus from them could become air-borne and so liable to such effects from change of humidity as were the subject of these experiments.

For some time past R. E. Hope Simpson[2] has drawn attention to a relationship between morbidity from common colds and relative humidity. In particular, curves showing the difference between indoor and outdoor humidity closely parallel those of morbidity due to colds. As with influenza, it is the temperatures indoors during the day which favour colds, for, "with the approach of autumn, and the lighting of fires, a progressively intense drying of the air is closely followed by a steep rise in respiratory diseases." Unfortunately Hope Simpson is compelled to add, "There is, alas, no easy way to warm a room while maintaining the air humid."

These correlations perhaps make the epidemiology of some virus infections sound deceptively simple. Yet the effect of season on incidence of disease is a puzzling thing and any clue deserves to be followed to the end.

THE NATION'S HEALTH IN 1959

In the last annual report[1] he will sign before his retirement from the post of Chief Medical Officer of the Ministry of Health, Sir John Charles has some encouraging and also some more sombre figures to record. The infant mortality rate in England and Wales in 1959, at 22.2 per 1,000 live births, and the maternal mortality rate, at 0.32 per 1,000 births, were lower than ever before. Although infant mortality was less in the Netherlands, child mortality between 1 and 14 years of age was lower in England and Wales than in any other country. In 1959, for the first time, there were no deaths from diphtheria, and deaths from scarlet fever (1), whooping-cough (25), acute poliomyelitis (66), tuberculosis (3,854), acute rheumatism (126), and syphilis (958) were the lowest ever recorded. On the other hand, deaths from motor-vehicle accidents numbered 6,026, 600 more than in 1958: in males between 15 and 24 years of age 41% of all deaths were the result of road accidents. The total of deaths from the cancers (97,117), and from lung cancer in particular (21,063), were the highest recorded up to date. Although the total number of deaths assigned to heart disease, including coronary artery disease, was not a record, the number of deaths from coronary artery disease (84,922) was greater than in any previous year.

For the first time in any year there were no deaths from diphtheria in 1959, but the number of notifications was the highest since 1955. The percentage of children under 5 who have completed a primary course of immunization is now 56.3, and Sir John urges the continuing need for protection against diphtheria. In particular, the importance of giving a reinforcing dose of prophylactic to children about to enter school is as great as ever.

Dysentery and food poisoning are still too prevalent. Dysentery is not evenly distributed over the country, Wales providing the highest proportionate number of notifications. The fact that the number of food-poisoning "incidents" (7,846) was 546 more than in 1958 shows once again that prevention is not yet as effective as it should be. New cases of gonorrhoea rose by 12% to 31,344, the highest figure since 1947.

As usual the Chief Medical Officer's report contains a mass of information about mortality and morbidity and about the public health services. A final chapter on recent developments in urology is a little outside the main body of the report and leads Sir John Charles to observe that modern surgical progress seems to have as one of its inherent characteristics the development of techniques requiring for their performance a highly trained team of workers whose efficiency is purchased at the expense of the wider disciplines within surgery itself. No doubt surgery is becoming more specialized as a consequence of technical advances, but perhaps a subsidiary cause may be the successes of preventive and curative medicine in overcoming a number of the common diseases which, as Sir John Charles himself so ably shows, are no longer the menace they used to be.

INSULIN

Insulin is the subject of the September number of the *British Medical Bulletin*.[1] Professor Charles H. Best writes a stimulating account of the history of the discovery and development of insulin, and this is followed by a description by Dr. F. Sanger of the techniques used to determine its chemical structure. There are articles on the part played by insulin in fatty-acid, protein, and carbohydrate metabolism, followed by a section on its mechanism of action. These articles show how much the department of biochemistry of the University of Cambridge has contributed to the study of insulin action, and it is appropriate that Professor F. G. Young, F.R.S., is scientific editor of this number of the *Bulletin*.

There are also articles of more immediate interest to the clinician. Those on insulin in blood, insulin antagonists, and insulin antibodies suggest the possibility that circulating antagonists may in some cases initiate the diabetic process. There are also sections on endocrine disorders and insulin action and insulin in clinical practice. Finally, two articles deal with the chemistry and clinical effectiveness of substitutes for insulin—the oral hypoglycaemic agents.

The articles on the scientific aspects of the action of insulin and of its antagonists in the blood are valuable reviews. There seems to be little doubt that research in Great Britain has contributed a great deal to our present knowledge. At the same time much remains to be done in clarifying the confusion over circulating antagonists and the problem of how insulin acts in normal and diabetic subjects. Until this has been done there seems to be little hope of progress in preventing the development of diabetes or reducing the incidence of the late complications.

[1] *Report of the Ministry of Health for the Year 1959. Part II—On the State of the Public Health*, 1960. H.M.S.O., London. Price 13s. net.

[1] *Brit. med. Bull.*, 1960, **16**, 175-264.

W.H.O.'s WORK IN EUROPE

The World Health Organization's regional office for Europe is in Copenhagen, and the recently issued annual report[1] of the regional director has a special interest because it covers the first ten years of the activities of the regional office. When the Special Office for Europe was set up in 1949 its main object was to restore the level of health in an area devastated by war. After the urgency of crisis passed the assistance offered assumed a new pattern, of which the first director, Dr. Norman Begg, was the designer. From that time onwards there was a steadily expanding range and scope of health work.

During the year July, 1959, to June, 1960, a number of important changes in policy have taken place, notably in the balance between the control of communicable disease and the growing demand for study of the more chronic conditions which have risen into relative prominence, such as cancer and the cardiovascular diseases. The claims of this type of research were responsible in part for the creation of a new section in the regional office, for epidemiology and health statistics; and more recently an additional unit has been formed to concern itself with the chronic diseases. These changes reflect the general trends in health work to-day. Unhappily events have a habit of cutting fiercely across the straight lines of organization. During the year one of the member States, Morocco, suffered two gross disasters, and the strongest efforts of the regional office had to be directed towards alleviating the miseries of ten thousand neurological casualties caused by the contamination of cooking-oil with orthocresyl phosphate. And then came the catastrophic earthquake of Agadir, in which also the regional office gave prompt and effective assistance.

One of the most striking advances in the general programme of assistance in Europe has been the progressive clearing of barriers between East and West. A travelling seminar on public health administration was held in the U.S.S.R., and a symposium was held in Prague on the pathogenesis of essential hypertension. In addition, there has been a marked increase in the number of *ad hoc* courses sponsored or assisted by W.H.O., especially in the Eastern countries of the region. These included courses on the natural foci of infection (in the U.S.S.R.), on virology and water sanitation (in Czechoslovakia), and on veterinary public health (in Yugoslavia). There were 24 courses in all, double the number of the previous year. Special reference should be made to the highly successful pioneer course in hospital and medical administration which took place in Edinburgh in 1959. This course is being repeated this year.

In 1959 six countries benefited by the technical assistance programme—France (Algeria), Greece, Morocco, Spain, Turkey, and Yugoslavia. It is interesting to note that in the coming year the beneficiaries will include Albania and Poland. The help offered is mainly in the form of fellowships and the provision of consultants for a limited period. Because of their special needs, however, Morocco, Spain, and Turkey are being provided with the services of consultants on a long-term basis. The scheme for controlling trachoma, which should have highly beneficial results, has been extended to five countries. Education and training services have been expanding steadily, and it is evident that increased expenditure in this activity would be well repaid, for the demand is great and the results lasting and economically useful. Good progress has been made in overcoming language barriers, and one country has agreed to support a course of eight months of full-time language study for selected candidates.

In the sphere of public health administration continued emphasis has been laid on the problem of rural areas; courses have been held in Finland and in France, the chief object being to give students a variety of practical experience. Important contributions have also been made in nursing, maternal and child health, and, as the subject for technical discussions at Bucharest last year, in mental health. The theme, which has been followed this year also, is "The place of mental health in public health programmes." Plans for the future include work on child and family guidance, epidemiological studies in mental health, and undergraduate training in psychiatry.

One of the few blemishes in this excellent report is its almost pathological anonymity. Even the signature to the foreword is illegible and unelucidated in the text, and the illusion is given that all the work has been carried out by some electronic agency and not by human effort. The reader has to asume that a staff exists in the regional office and that its members have names, experience, and individual interests.

[1] World Health Organization. Regional Office for Europe, Copenhagen. *Report of the Regional Director, July, 1959, to June, 1960.*

THE NEW ZEALAND MEETING

The full programme of the Annual Meeting of the British Medical Association in New Zealand next February is published in this week's *Supplement*: it is being held in conjunction with the Biennial Conference of the New Zealand Branch. Most of the shipping companies are now booked up, but it is still not too late to make arrangements to travel by air. Our colleagues in New Zealand have arranged a scientific programme of plenary sessions, round-table conferences, and section meetings very much on the lines of Annual Meetings in Britain, and besides speakers from New Zealand and Australia many eminent British authorities will be taking part in the discussions. From the official opening of the Meeting by the Governor-General and the presidential address by Sir Douglas Robb on February 6 to the Conference Ball on the evening of February 10 there will be a great variety of medical and social occasions for the enlightenment and entertainment of those fortunate enough to attend. Visitors from Britain will be certain to return home with an increased affection and respect for a country with which the medical profession's ties have always been particularly close.

THE DRINKING DRIVER

SURVEY OF 100 CASES OF DRIVERS ALLEGED TO BE UNDER INFLUENCE OF ALCOHOL

BY

SIMON FREEMAN, T.D., L.R.C.P.&S.Ed., L.R.F.P.S.
Divisional Police Medical Officer, City of Manchester

This survey covers the period between the spring of 1958 and that of 1960, approximately two years. During that period I was for eighteen months one of six deputy police surgeons for the City of Manchester. There was one full-time police surgeon. Each deputy, in turn, undertook two weeks' duty as first on call to cover the entire city when the police surgeon was not available. For the period of six months after the retirement of the police surgeon, each deputy continued the rota duty of being first on call for two weeks. From this it will be seen that the survey covers a fair cross-section of the total suspects examined in this city during the period. Since April, 1960, a new system has been devised, in which five divisional police medical officers have been appointed, each of whom is responsible for one division.

Procedure

When the duty divisional inspector considers that a driver *may* be under the influence of alcohol or drugs, a telephone call is made immediately to the police surgeon on call, and if he is available a police car is sent at once to collect him. This saves valuable time, and it has been the rule rather than the exception for me to arrive at the police station within fifteen to thirty minutes from the time the driver was brought into the station. The driver is asked to accompany me into an office where the lighting is good and there is adequate room for examination. Where possible, the duty inspector accompanies us into the examination-room and sits quietly throughout the examination. This is regarded as necessary to safeguard the examiner from possible assault, particularly when the opinion is given at the end of examination that the driver is unfit, because of alcohol, to drive a motor vehicle. The quiet and subdued driver occasionally changes at that point with almost dramatic suddenness into a violent creature, and one is only too glad of the protection of the law.

Before attempting to carry out an examination the consent of the driver must be obtained, and it was the practice, during the cases covered by this survey, to ask him to complete a certificate of consent as proof of his willingness to be examined. He is also informed at this stage, and again on completion of the examination or observation, that he may ask for his own or any other doctor of his choice to attend in order to examine him. Should he refuse examination, he is observed for a period varying from 20 to 30 minutes, and an opinion is then given. During that period he is asked from time to time whether he would like to change his mind and agree to examination. In approximately 50% of the cases seen, the driver made a request for the attendance of another doctor, but only in six cases did the doctor agree to attend. In most cases the doctor made it clear that he was prepared to accept the opinion of the police surgeon, having regard to the time lag which would have to be present before he could examine, and the fact that he had not had sufficient experience of this type of case.

Where certification of incapacity is refused by the police surgeon the police may still proceed with the charge, taking into account the incidents which have led to the arrest and the testimony of eye-witnesses. This has never occurred in the cases described in this survey where I have refused certification. In all such cases the opinion expressed was accepted without question, the driver was handed the keys of his car, and no further action was taken.

The Examination—with Clinical Features

Once the driver had intimated his consent to examination, he was asked to read aloud the certificate of consent which he was told he would be asked to sign. As will be seen from the form and wording of this certificate (Fig. 1), the reading and completion by the driver acted as a valuable test of reading, writing, and memory. This was used in lieu of reading from a newspaper, and the certificate was produced as an exhibit in court where required. The examination then proceeded on the lines indicated in the B.M.A.'s publication, *Recognition of Intoxication*, under the chapter headed "A Suggested Scheme of Medical Examination."

DR. SIMON FREEMAN, T.D.
Divisional Police Surgeon, Manchester

I hereby consent to be examined by Dr. Simon Freeman in connection with my fitness to be in charge of a mechanically propelled vehicle.

USUAL SIGNATURE .....

ADDRESS .....

.....

DATE .....

FIG. 1.—The certificate, to be read aloud by the driver.

The time of commencement of the examination was carefully noted, and the pulse was taken both then and on completing the examination. A careful check was made for any possible injury. The question of the part played by fatigue and shock, as well as excitement, was given the fullest consideration. Every effort was made to ascertain the previous medical history and whether any drugs were being taken. Leading questions regarding fits, diabetes, and history of ear disease were asked on all occasions. In all tests of co-ordination, each was carefully demonstrated to the patient before asking him to make the attempt. This served the twofold purpose of making it clear that the tests were normally quite easy to carry out and of satisfying a court of law that this was the case. Consistent features noted were the rapid, full, and bounding pulse, subnormal temperature, slightly raised blood-pressure (both systolic and diastolic), suffused conjunctivae, dry and furred tongue, and widely dilated pupils with sluggish response to light. Although each and every one of the above could be explained by other conditions, their presence did help to complete a pattern which was present with remarkable consistency.

The presence of fine lateral nystagmus deserves special mention, since our findings bear out completely the importance of this feature as stressed in the publication *Recognition of Intoxication*. This is shown in the statistical findings in this survey. It is, of course, of manifest importance to exclude other causes of this sign. Having done so, the presence of fine lateral nystagmus in the cases seen was so consistent with the remainder of the examination that it would seem to be

a major factor in a final verification of the decision made. In this connexion, it was put to me by counsel early in the survey that this sign was often present in normal healthy individuals. It was impossible to dispute this suggestion from personal experience at that stage. The question was put to me again in the Crown Court during the hearing of one of the last cases described in this article. In the interim, I had examined approximately 700 recruits for the Territorial Army and had carefully checked each one for the presence of this sign, with a " nil " return. In my reply to counsel, I asked for, and obtained, permission to give the results of this check. The cross-examination then came to a sudden halt.

The greatest importance was attached in all cases to the possibility of neurological disease. Examination of the ears and hearing was given special attention and the results were noted. This aspect is a great favourite of defending counsel in attempting to discredit co-ordination tests.

The average time taken to carry out the examination was 20 minutes. On completion the driver was told of the opinion formed and his comments were requested. These were carefully noted, when printable.

It is interesting to note that all cases where consent to examination was refused were certified after observation for the usual period. Gait, behaviour, appearance, speech, and co-ordination were carefully watched and noted. In most cases permission to smoke was asked and given ; cigarettes were dropped, and then there was difficulty in finding the cigarette tip with match or lighter, and even, in extreme cases, in getting the cigarette to the mouth. All such points added up, and it was apparent that refusals were largely made by those who had sufficient acumen remaining to realize that examination would result in certification. As will be shown, in all such cases the men were not only certified but were duly convicted.

Statistical Survey of Findings

Certification.—The trend followed a distinct and consistent pattern throughout. Approximately two out of every three were duly certified as being under the influence of alcohol to such an extent as to render them incapable of having control of a motor vehicle. The final figure (Fig. 2) was 69%.

Convictions and Acquittals.—As shown in Fig. 2, of the number certified (69), exactly two-thirds (46) pleaded guilty and were duly convicted in the magistrates' court. Of the remaining 23, 17 were convicted after trial—twelve in the magistrates' court, five in the Crown Court. The other six were acquitted —five in the magistrates' court and one in the Crown Court. Of the acquittals, two cases hinged on whether the accused was in fact in charge of a car at the relevant time ; two were thrown out as a result of somewhat conflicting evidence of police and eye-witnesses ; in the remaining two cases it was decided that there was some reasonable doubt in the minds of the court.

Certification Refused.—It is a point worthy of serious notice that of the total of 31 in this category 30 were adjudged borderline cases, and the drivers concerned had to be given the benefit of the doubt. In the remaining case the driver was quite sober on examination. He had apparently caused his car to swerve badly while lighting a cigar and had become very argumentative and truculent when pulled up. The arresting constable, with commendable zeal, decided that a medical opinion was desirable.

Examination Refused.—Nine drivers refused to be examined. All were duly certified after observation. Seven pleaded guilty, and were convicted in the magistrates' court. The remaining two were convicted after trial. This tends to confirm the impression gained

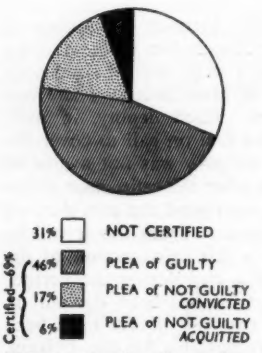


FIG. 2.—Results of examination.

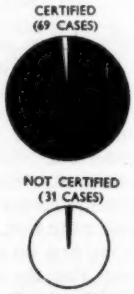


FIG. 3.—Showing fine lateral nystagmus present in 67 of 69 certified and in 2 of 31 uncertified cases.

that refusal is consistent with a feeling of guilt and a fear of the results of examination.

Fine Lateral Nystagmus.—This is worthy of special statistical note (Fig. 3). Of the 69 certified cases, 67 showed this sign. It was also present in two of the non-certified: these two also had major physical disabilities which finally swung the pendulum in favour of non-certification. They were both extremely fortunate.

Time of Examination.—This followed the anticipated pattern, consistent with opening and closing times of public-houses and the multitude of drinking-clubs which are a feature of large cities. This is shown in Fig. 4. The irregular jump between 6 p.m. and 9 p.m. is heavily shaded to show 9 of the 16 in that period which occurred in the few days preceding Christmas and, from the

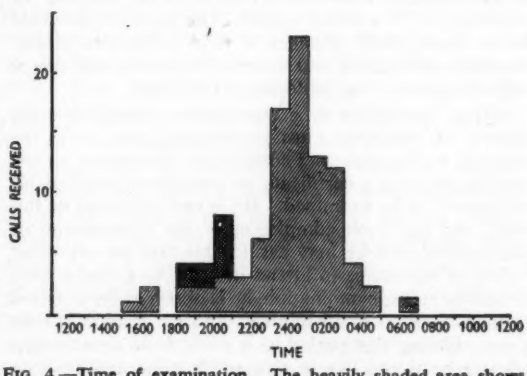


FIG. 4.—Time of examination. The heavily shaded area shows the jump between 6 and 9 p.m.

history obtained, followed office drinking-parties (known in Lancashire as " footing parties "). At such parties inexperienced drinkers are plied with liquor by well-meaning but stupid colleagues and employers. It is a custom which cannot be condemned strongly enough. All nine drivers thus involved were in the early twenties

and presented a pathetic spectacle when they were sober enough to realize the consequence of their folly. None had ever before been in a police station.

Age Factor.—As demonstrated in Fig. 5, cases occur fairly consistently between the ages of 20 and 50. It is possible that after the age of 50 drivers have either reached the age of maturity or have not the desire to participate in drinking in public places. This might make an interesting study for the psychologist or even the psychiatrist. In the light of the condemnation of the modern teenager, it is worthy of note that not one driver in the survey was under the age of 20. This would appear to be the solitary silver lining in a very grey sky.

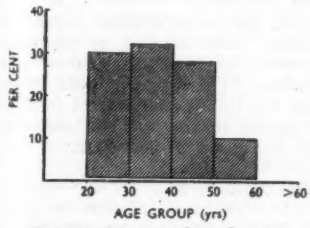


FIG. 5.—Age-grouping of cases.

Comparison of Total Convictions.—The accompanying Table demonstrates the comparison between results in this survey and those shown in a written reply by the Home Secretary (*Relation of Alcohol to Road Accidents*, B.M.A., 1960). It will be seen that convictions in magistrates' courts follow an almost identical trend. There is, however, a wide disparity in convictions in the higher courts. It is not possible to attach much significance to this feature, as the number of cases in this survey referred to the Crown Court was too small to be of statistical value.

Comparison of Convictions in Cases Certified as Unfit to Drive a Motor Vehicle

Court	This Survey	*Statistical Report of Home Secretary for Year 1957
Magistrates' (i.e., without jury) ..	92% (58 out of 63)	91%
Sessions or Assizes (i.e., with jury)	83% (5 out of 6)	48%

* *Relation of Alcohol to Road Accidents* (B.M.A. publication, 1960).

Discussion

It will be seen that, before conviction, a motorist has to be considered under the influence of alcohol or drugs at four distinct and separate phases. At any single one of these he might be found not to be "unfit to drive."

Phase 1.—The constable on patrol notes in the first instance some behaviour consistent with the effects of alcohol.

Phase 2.—The duty inspector may consider that there are insufficient grounds to call in the police surgeon.

Phase 3.—The police surgeon may, or may not, certify the driver as unfit to have control of a motor vehicle.

Phase 4.—The court of law may, or may not, convict.

By the time the fourth phase has been concluded justice surely has been done. In all cases seen in this survey no conviction has been recorded about which there has been, in my mind, the shadow of a doubt. On the other hand, looking back at the cases in which it was felt that there was some reasonable doubt and thus were not certified, there remains a twinge of conscience, since in few of them would I have allowed the driver to have my family or myself as a passenger. Although justice not only must be done but must appear to have been done, it would seem to me that, if the court leans over backwards to carry this out, the public at large may not be getting the protection it deserves. This is a matter for serious thought, and the results of this survey seems to confirm the following opinion extracted from *Relation of Alcohol to Road Accidents*: "The evidence given . . . shows that existing measures intended to prevent a person driving a motor vehicle while under the influence of alcohol are inadequate."

A feature of this survey was the tremendous variation in the amount of liquor admitted to have been consumed. The effects would appear to have been influenced greatly by drinking habits, by temperament, and by relationship to food consumed. Some were certified who had obviously taken small amounts of alcohol; the effects do not bear consistent ratios with the speed or amount of consumption. For that reason urinalysis was not carried out in the cases surveyed. The procedure has now been altered, however, at the wish of the Chief Constable. Urinalysis will be done in all cases, whether certified or not, where the consent of the driver has been obtained. Results of such analysis will be sent to the police surgeons concerned, and the relationship between the clinical opinion and decision and the results of such urinalysis is being watched by all parties with great interest. This will be shown, it is hoped, in a further survey now being undertaken.

Frequent reference has been made in this survey to two B.M.A. publications, namely, *Relations of Alcohol to Road Accidents* (1960) and *Recognition of Intoxication* (1958). It is my strong view that those two excellent publications should be read and retained not only by all members of the medical profession, but also by members of the legal profession and by those who are responsible for making and administering the laws of the land.

Finally, tribute must be paid to all ranks of the police force of this city for the patience and forbearance in the handling of all the cases covered in this survey. In spite of much virulent and blasphemous abuse, and in some cases of actual physical violence, members of the force have acted on all occasions with a restraint which must have required a great effort of will. In view of the many current criticisms of the police forces in this country, it is to me a great pleasure, as well as a duty, to place on record the high pattern of behaviour which has been manifest throughout.

It is a pleasure to acknowledge the help, offered and accepted with equal alacrity, of Dr. R. G. Ollerenshaw and Mr. James Kilshaw, of the Department of Medical Illustration, Manchester Royal Infirmary, who have succeeded so well in making presentable my statistical data.

"The London County Council and the Building Research Station of the Department of Scientific and Industrial Research are to carry out large-scale research into background noise in London. Measurements of the existing background noise levels, outdoors and indoors, will be made at about 500 sites distributed uniformly over an area covering some 36 square miles and at each site sample recordings of noise levels will be made over a 24-hour period. These recordings will be subsequently analysed. A separate social survey designed to establish accurate data about the acceptable levels of noise in various places within the county is also desirable, but the precise arrangements for carrying out such a survey have not yet been settled. The Metropolitan borough councils and other public authorities concerned are being asked to co-operate." (Agenda, L.C.C. Meeting, November 8.)

LEGALITY OF STERILIZATION: A NEW OUTLOOK

[FROM OUR LEGAL CORRESPONDENT]

In the course of a recent address to the Medical Society of London, Lord Justice Devlin showed that there is some judicial support for a more liberal view of the law relating to sterilization. The traditional view is that sterilization is forbidden by the law of criminal assault and its statutory variants, though it may be justified if performed in order to save life or health. Lord Justice Devlin said that sterilization, if done without consent upon a normal person, would be a criminal assault of a most wicked kind. He suggested, however, that an assault should not be treated as criminal if done either (1) to avert danger to life, or grave and immediate danger to health; or (2) with the consent of the other party and for a purpose not otherwise criminal. If it was thought that sterilization by consent should be prohibited except for grave medical reasons, this should be made a crime in itself and the law should not try to catch it as a form of assault (*The Times*, November 4).

As a statement of what the law ought to be, Lord Justice Devlin's remarks will receive a very large measure of support from the legal and medical professions. It is problematic, however, whether this view is consistent with the actual state of the law on the authorities as they now exist.

New Opinions

The change in the wind of opinion over recent years has prompted the Medical Defence Union to seek fresh advice on the legality of sterilization. Leading and junior counsel have advised the Medical Defence Union in a joint opinion on the English law, and Scottish counsel have likewise delivered a joint opinion on the Scottish law to the Medical and Dental Defence Union of Scotland.

For some time there has been little doubt that sterilization is lawful when performed on a consenting party for certain therapeutic reasons. Both English and Scottish counsel in the opinions now received by the Defence Unions go further than this. However, they confine their opinions to considering the case where there is full and valid consent to the operation by the patient concerned. They do not attempt to explore the difficult and interesting questions surrounding a purported consent given by a person of unsound mind[1] or by an infant. (Consent by an infant under 16 would almost certainly be invalid: consent by a infant between 16 and 21 may or may not be invalid,[2] but it would generally be inadvisable to rely upon such consent in cases of this sort.) With this limitation of scope in mind, it is possible to summarize the pith of the English counsel's opinion as follows: An operation for sterilization is not unlawful whether it is performed on therapeutic or eugenic grounds or for other reasons, provided there is full and valid consent to the operation by the patient concerned. This proposition, however, has no direct judicial authority to support it, because it has never been tested in the courts. The first case to come before a court would be in the nature of a test case and would establish a precedent of the utmost significance. Although confident that the courts would uphold the legality of a sterilizing operation performed on therapeutic or well-founded eugenic grounds, counsel are of opinion that the risk of an adverse finding increases as the reasons for the operation are medically less well founded.

The Scottish counsel summarize their opinion of the position in Scottish law in these words: "We have formed the opinion that, if a sterilization operation were performed with the full consent of the patient by a responsible surgeon and if the reason for doing it was substantial and not obviously immoral by present-day standards, it is exceedingly improbable that the Court would hold the act to be criminal."

SUMMARY OF ENGLISH OPINION

Many earlier views of the law on sterilization expressed opinions formed by analogy from the law of abortion. The English counsel, however, eschewed such analogy and reasoned from first principles. The question facing them was whether an operation for sterilization was of itself a criminal act of such a quality that it was not rendered lawful by the consent of the patient upon whom it was performed.

Counsel first cleared one difficulty away by stating their view that all operations for sterilization fell into the same legal category notwithstanding any variety in technique[3]: in principle there was no distinction between an operation which involved breaking of the skin and one which did not.

Offences Against the Person Act, 1861

Apart from abortion, which was specifically forbidden by statute, a surgical operation could only be criminal in so far as it constituted either wounding, or the infliction of bodily harm, or an assault. What status had the patient's consent in the jurisprudential analysis of these crimes? Was it true that every surgical operation was *prima facie* lawful until shown otherwise, the operation only being a criminal offence if some extraneous criminal ingredient appeared in a particular case? Or was the converse proposition to be preferred—namely, that every surgical operation was prima facie unlawful, only ceasing to be an offence in any particular case if a "just cause" or "lawful excuse" appeared? These crimes were codified in the Offences Against the Person Act, 1861, from which the vital extracts were as follows:

Section 18: "whosoever shall unlawfully and maliciously by any means whatsoever wound or cause any grievous bodily harm to any person . . . with intent to . . ."

Section 20: "whosoever shall unlawfully and maliciously wound or inflict any grievous bodily harm . . ."

Section 47: . . . "assault occasioning actual bodily harm. . . ."

In counsel's view, no offence would be committed under section 47 unless consent was absent, as section 47 dealt with assault. They considered, however, the question whether the surgeon committed an offence against section 18 or 20 notwithstanding the consent of the patient to sterilization. The ingredient common to these sections was the infliction of bodily harm. Sections 18 and 20 both contained the qualification "unlawfully and maliciously," and section 18 required that the infliction was made "with intent." "Maliciously" there meant the intention to do the particular kind of harm done. "Unlawfully" meant, in the words of Stephen J., "forbidden by some definite law"[4]—that is, not an act which was merely immoral. In general, no onus of proof rested on the accused. It might be said that, to show the act to be unlawful, *either* the prosecution must prove that the act by reason of the circumstances was "unlawful" *or* the prosecution must prove that the accused had no lawful excuse: which of these alternatives was the correct one depended on the question whether a surgical operation was or was not *per se* a criminal act.

What is a Crime?

To answer this question, counsel considered the basic question of what constituted a crime. The basic rule of

[1] *Vide* Williams, Glanville, *The Sanctity of Life and the Criminal Law*, 1957, pp. 108–9. Faber, London.
[2] Addison, P., *Brit. med. J.*, 1960, I, 976.
[3] But see below under "Comment." The possibility of a reversal operation might be important.
[4] R. *v.* Clarence (1889) 22 QBD 23 at p. 40

English law,[6] subject to very few exceptions, was that nothing was a crime unless it was plainly forbidden by law. Analysis of this principle was usually divided into analysis of the *actus reus* (forbidden act) and of the *mens rea*. The modern view of the *actus* was that, to determine whether it was *reus*, one must look at the surrounding circumstances (e.g., the allegation that A had killed B did not of itself aver an *actus reus*: the killing might be lawful execution). On this view, said counsel, the allegation of the cutting of skin by a knife did not of itself aver an *actus reus*. There was, however, a much older form of analysis which divided forbidden acts into those which were *mala in se* and those which were *mala prohibita*.[6] Acts *mala in se* were "unlawful in themselves," while acts *mala prohibita* were merely forbidden. One could not give an effective consent to an act *malum in se*. If surgical operations were *mala in se*, consent was irrelevant, and the only question was whether there was lawful excuse for it. The *malum in se* test had been relied upon in modern times in R. *v.* Donovan,[7] a case of indecent sadistic assault upon a consenting person. But this case could be distinguished as applying only to its own facts. In any case, a surgical operation would not fall within the category of *malum in se* as described in that case.

"Bodily Harm"

Turning from the meaning of "unlawful," counsel considered the meaning of "bodily harm" in the sections referred to. They doubted whether a surgical operation properly performed could be said to cause "bodily harm," grievous or otherwise. Grievous bodily harm need not be permanent or dangerous, but it must be such as seriously to interfere with comfort or health.

In counsel's view, the *actus* of a surgical operation (except for the special case of abortion) was only *reus* if there was some ingredient additional to the circumstance of a bona-fide surgical operation—e.g., a personally criminal (in the sense of a morally reprehensible) motive on the part of the doctor so that the surrounding circumstances had a criminal colour. Hence a surgical operation (including a sterilizing operation) properly performed was by itself neither an act *malum in se* nor an *actus reus*. For the same reasons, a cosmetic operation was lawful, though not necessary for the life or health of the patient.

Importance of First Case

There was no direct authority to support this view, but counsel took encouragement from the views of Lord Evershed and Hodson L.J. in Bravery *v.* Bravery,[8] a matrimonial case, in which they expressly dissociated themselves from the observations of Denning L.J. regarding the position of sterilization in the criminal law.[9]

Counsel's reasoning made no distinction between eugenic sterilization and sterilization performed for other reasons such as personal convenience. However, it would be more difficult to argue the first test case on obviously unmeritorious facts.

SUMMARY OF SCOTTISH OPINION

Scottish counsel, in considering the Scottish law, gave as their opinion that the carrying out of sterilization upon a consenting patient by a qualified person was not *per se* a crime and would not necessarily be held to be a crime (even though the sterilization was not necessary for the preservation of life or health), so long as the circumstances surrounding the doctor's conduct and particularly the motive for which the treatment was carried out were not such as to be plainly offensive to the public conscience or contrary to the public interest. It was commonly agreed that, in general, sterilization without consent in all probability would be a crime; and that sterilization with consent where necessary for the preservation of life or health in all probability would not be a crime.[10] Accordingly, counsel considered only the case where consent had been given, but the justification of necessity for life or health of the patient was absent.

Absence of Evil Intent

In Scottish law, surgical operations *per se* were not, in counsel's opinion, prima facie criminal acts, and in particular were not *per se* assaults. Whether in any particular case a surgical operation was an assault and therefore criminal depended entirely upon circumstances, one of the most important of which was the presence or absence of consent. It was essential in the Scottish law of assault that there should be some evil intent against, and some "attack" upon, the victim[11]: in the normal surgical operation these elements were clearly absent and there was thus no prima facie criminality which the practitioner need rebut by showing justification (or in English terms "lawful excuse").

It had been argued previously by Scottish lawyers that consent of the patient to sterilization would not itself render the operation legal. Such lawyers taking this view had relied upon H.M. Advocate *v.* Rutherford.[12] This case decided that consent of the victim was no defence to a charge of murder. In counsel's opinion this was not a proper analogy, as in Scottish law the taking of human life was a crime in itself and consent could not excuse it: but, in counsel's view, a surgical operation was not of itself a crime, and hence the question whether consent provided "justification" or "excuse" did not arise. Counsel also, like their English counterparts, rejected the analogy of abortion. Further, they considered that the conduct in question in R. *v.* Donovan would not be held to constitute the crime of assault in Scottish law (though it might be criminal because of the element of indecency).

Power to Discover New Crimes

So far, Scottish counsel were in agreement with the opinion given by English counsel, and also had so far covered much of the same ground, as the Scottish issue of assault included most of the criminal acts covered by sections 18, 20, and 47 of the Offences Against the Person Act, 1861, an Act which did not apply in Scotland. Consideration of Scottish law, however, had to go further, since there was no fixed calendar of crimes in Scotland: The Scottish Supreme Criminal Court had a general inherent power to discover and punish new crimes which was quite contrary to English legal thought. It was thus difficult for a Scottish lawyer to assert with confidence that any particular conduct, which might possibly be thought shocking to the public conscience, would not be held to be a crime. The difficulty was increased by the absence of any satisfactory definition of "crime" in Scottish law, beyond statements to the general effect that the conduct in question must be "anti-social" by current standards. In counsel's opinion, however, the court would be most reluctant to declare a new crime, and would only do so in regard to conduct which was clearly antisocial. In their view such an act would have to be one involving one or other of three elements: (*a*) harm or hurt done to another against that other's will; (*b*) a damage to the public interest in a fairly direct sense; or (*c*) a very clear element of moral turpitude. Where the patient consented, "(*a*)" was not applicable. In some cases there was a clear element of moral turpitude and damage to the public interest (e.g., sterilization of a

[6] But not of Scottish law.
[6] *Blackstone's Commentaries*, 1766, 2nd ed., pp. 54–58. Clarendon Press, Oxford.
[7] [1934] 2 KB 498.
[8] Bravery *v.* Bravery [1954] 3 All ER 59.
[9] Both Denning and Hodson L.JJ. have now been elevated to the House of Lords.
[10] The position is the same in English law.
[11] *Alison's Principles of the Criminal Law of Scotland*, 1832, Vol. I, p. 175. William Blackwood, Edinburgh.
[12] [1947] JC 1.

prostitute for the convenience of her trade). In cases of sterilization for the convenience of an ordinary person, it would be difficult to aver damage to the public interest, and in eugenic sterilization even more difficult.

COMMENT

The practical position in both the English and Scottish law is that a surgical operation is generally not a crime if performed with the consent of the patient. (Sometimes, as in cases of emergency, consent may be implied.) However, the performance of some operations is harmful to the public interest, and the State through the criminal law deprives any purported consent to such operation of any validity in public law (though such consent would generally bar an action for damages at civil law). The effect of such a provision on its own would be to make the operation in question totally illegal. The State, however, mitigates this effect by saying that, although the surgeon cannot rely on the patent's consent for immunity from criminal penalties, yet if he has that consent and there are also circumstances in which the individual interest (in life or health) may legitimately override the public interest the operation is lawful.

An Undecided Question

The oracles of the Common Law and of Scottish Law have not yet disclosed whether the operation of sterilization is considered in itself harmful to the public interest. But if it is contrary to the public interest there are undoubtedly circumstances in which that public interest takes second place and the operation can legally be performed to avert danger to life or health. Both the opinions now obtained by the Defence Union support the view that according to English and Scottish law the operation of sterilization is not of itself harmful to the public interest and the patient's consent is sufficient warrant for the operation. However, it is considered that in Scottish law this must be read subject to the proviso that any elements of immorality attached to the operation would make it criminal.

The state of the law on this subject is such that no one can say with certainty what it is. Our courts will not answer questions put to them on hypothetical facts. The rulings of Common Law and Scottish Law can only be discovered by test cases on operations actually performed, and the state of the authorities is such that the courts have almost a free hand in deciding the law. The pitfalls are numerous and any aspirant hero would be well advised to take careful advice on the particular facts before operating. It will suffice to give one example of the sort of difficulty involved.

In considering an offence against section 18 of the Offences Against the Person Act, 1861 (unlawful and malicious wounding), English counsel say, briefly, that sterilization is no offence under that section because the judicial definitions of the vital ingredients of that offence show that they do not appear in this operation. Thus: (*a*) "Unlawfully" means forbidden by some definite law, and there is no such definite prohibition of law relating to sterilization. (*b*) "Bodily harm" means serious interference with comfort or health, and sterilization does not inflict such harm. (*c*) "Maliciously" means only with intent to inflict the particular kind of harm done.

The prosecution might object as follows: As regards (*b*) and (*c*), depriving a person of a natural and normal ability must be an interference with his health, and depriving a man of the power of procreation is as much an interference with health as amputating a healthy limb. Such an argument might be met by using a technique of sterilization which allows reversal. As regards (*a*), unlawful does not mean forbidden by some definite *criminal* law: indeed, in the case cited,[4] Stephen J. held an act to be unlawful because forbidden by matrimonial law. It is clear that, in some circumstances, sterilization of one spouse without the consent of the other may amount to cruelty and so be forbidden by matrimonial law.[5] Hence, if an operation of sterilization is such that it would constitute matrimonial cruelty on the part of the patient, it may well be that the surgeon performing it commits an offence against section 18 of the statute.

Whatever may be the law on sterilization, it is clearly most desirable that the courts or Parliament should now declare it.

BRITISH ORTHOPAEDIC ASSOCIATION

[FROM A SPECIAL CORRESPONDENT]

The forty-second annual meeting of the British Orthopaedic Association was held in Leeds and Harrogate from October 27 to 29, under the chairmanship of the president, Mr. H. J. SEDDON. During the meeting Robert Jones medals and prizes for 1960 were presented to Dr. M. Makin, of Jerusalem, for his work on the osteogenesis produced by implants of vesical mucosa, and to Mr. G. S. Tupman, of Scarborough, for his study of bone growth in normal children.

Robert Jones Medallists

Dr. M. MAKIN said that the relationship between vesical mucosa and bone induction had long been recognized. It had been observed by Neuhof in 1917. He himself had studied the phenomenon in 160 guinea-pigs. He placed a piece of bladder mucosa under the lumbar fascia well away from any bone. In ten days an epithelized cyst formed and by three weeks there was osteogenesis around the cyst. At first the osseous matrix resembled provisional callus, but after the third week recognizable lamellae appeared, and, later, primitive marrow spaces. Injection experiments showed that the cyst was surrounded by a network of blood-vessels. The cyst contained a glairy fluid which if it escaped into the surrounding tissues promoted further ossification. The cyst was surrounded by an area of intense alkaline-phosphatase activity. If the vesical mucosa had previously been frozen it was absorbed without producing bone. An experiment was carried out in which vesical mucosa was placed into a bone-defect and the resulting union compared with that of a control. More bone was produced with the mucosal implant, but the rate of union was no greater. Dr. Makin concluded that here was a process of bone-formation which was different in that it was neither membranous nor cartilaginous.

Mr. G. S. TUPMAN (Scarborough) reported his investigation of the growth pattern in 200 maturing children between the skeletal ages of 7 and 16 years. Each examination comprised measurement of the child's total stature in centimetres and of the femur and the tibia by an accurate radiological technique. He had found that the rate of growth in the long bones of the legs was constant for each skeletal year, but that growth of the trunk was irregular and appeared to increase after the tenth year in girls and the eleventh year in boys. It was still not complete by 16 years in either sex. Comparison of these figures with those of Green and Anderson for American children showed that the latter grew more quickly and on average were ultimately taller. His findings made it possible to calculate the amount of growth to be expected from trunk or legs at any skeletal age, which might help in gauging the value of treatment for leg equalization or scoliosis.

Femoral Neck

The development, growth, and blood supply of the upper end of the femur were discussed in three papers.

Mr. E. N. WARDLE and Dr. M. BROOKES (Liverpool) discussed the influence of certain hip muscles upon the shape of the upper end of the femur. Mr. WARDLE pointed out that many factors affected the normal shape of the growing upper end of the femur. He dealt with two aspects of this—the development of valgus deformity and dislocation

resulting from it. He described these changes occurring in three different types of patient. Dr. BROOKES described a series of experiments carried out with a decalcified femur fixed so that forces could be applied to simulate the isolated effect of the psoas, the abductors, or the adductors. The psoas caused valgus deformity, untwisting of the neck, and increased bowing of the shaft. The abductors acting alone caused the exact opposite, and the adductors caused varus deformity, twisting of the neck, and increased bowing of the shaft. The equal pull of all resulted in normal shape.

Mr. A. H. C. RATCLIFFE (Southend-on-Sea) had reviewed 63 children between the ages of 3 and 16 years who had had fractures of the femoral neck. These were mainly transcervical (37) and basal (20). Twenty-one of the cervical fractures and four of the basal fractures resulted in avascular changes. These fractures were grouped as severe, involving the head and neck; less severe, involving the neck only; or localized, involving part of the head only. These types could all be explained on a vascular basis. Those without displacement (15) were treated conservatively, usually in a spica, and in all the results were good. If the fracture was displaced, manipulation and immobilization in a spica produced bad results, manipulation and internal fixation had 50% good results and 50% bad, and primary osteotomy had 50% good and 50% fair results. Although the numbers were as yet small, he thought this last method held out considerable promise in children treated under the age of 10 years. Mr. F. C. DURBIN (Exeter) said that in a smaller series he had found the results in undisplaced fractures much less satisfactory, with a high rate of avascular necrosis.

Mr. M. H. M. HARRISON (Birmingham) described a method for determining as soon as possible after fracture whether the femoral head was avascular. A specially designed needle was driven into the femoral head under *x*-ray control four weeks after the fracture. If blood could be aspirated it suggested that the blood supply was intact. Two ml. of an iodine dye was then injected, and, if the veins were intact and not thrombosed, the dye could be demonstrated radiologically entering the venous system. Mr. H. OSMOND-CLARKE (London) asked if this procedure could be done at once. Four weeks was too late. Mr. HARRISON replied that time must be allowed for the veins to thrombose. If done early there were many false readings.

During the meeting a clinical programme was provided in the Martin Wing of the General Infirmary at Leeds. One of the features of this clinical display was the number of tendon transplants which had been done for a great variety of conditions. Another interesting innovation was the Leeds modification of the Milwaukee brace for the correction of scoliosis. This brace combines the longitudinal extension of the Milwaukee brace with lateral flexion. Patients were shown in whom bone grafts had first been placed across the spine and whose spines had then undergone gradual correction while the grafts were consolidating.

Nova et Vetera

EARLY SURGERY

It can be said with assurance that Mr. Bishop* has succeeded in his purpose of telling "something of the giants who paved the way for the triumphs of modern surgery." The story of those triumphs was well told in *A Surgeon's Tale* (by R. G. Richardson), reviewed in this journal two years ago (November 1, 1958, p. 1088), so that the reader now has at his disposal two books which, together, excellently cover the whole history of surgery.

Mr. Bishop starts back in primitive times, touches lightly on the surgical methods used by man in early historic times in Mesopotamia, India, and Egypt, explains the importance of the Hippocratic surgical teaching, following its influence through the Dark and Middle Ages on to the more enlightened times of the Renaissance. From that time onward his book sparkles with incident and interesting stories of the great surgeons of the seventeenth, eighteenth, and nineteenth centuries. The author makes a mistake in saying that Reginald Fitz was a surgeon; he was a distinguished physician but he gave good surgical advice. On page 173 we think Lisfranc should be mentioned as a pioneer rectal surgeon.

This book will certainly prove interesting to surgeons and students. It should also please the lay public, who can here read of the operation performed on Pepys to which he so often refers. They can also learn some new facts about Crecy and Agincourt, and they will certainly wonder at the remarkable coincidence that the name of the surgeon who operated successfully upon Louis XIV and received £15,000 as a reward was Felix.

ZACHARY COPE.

**The Early History of Surgery.* By W. J. Bishop. (Pp. 192; illustrated. 18s.) London: Robert Hale, Ltd. 1960.

New Appliances

A "STAND-SIT" CHAIR

Dr. J. B. STEWART, consultant in physical medicine, Princess Margaret Hospital, Swindon, writes: The majority of armchairs in furniture stores are much too low for many patients with locomotor disorders. Patients with partial or complete fixation of their hips may find it beyond their powers to sit in a conventional chair, and, if they do manage to sit down in one, have to exert powerful leverage with their arms in order to stand up again. A struggle of this kind is too much for those with severe polyarthritis and certain neurological conditions.

The illustration shows a specially designed "stand-sit" chair for a patient with hips that are fixed in slight flexion. In this model a motor-cycle type of saddle is used, but a

bench-type seat may be fitted. The height and tilt of the seat are adjustable: maximum height 31 in. (79 cm.), minimum height 24 in. (61 cm.).

The back- and arm-rests are also adjustable to suit the arm length of the individual patient. Telescopic legs are fitted to the back legs so that the chair may be tilted to

(*Continued at foot of next page.*)

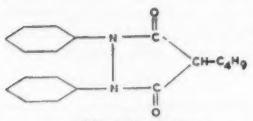
To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

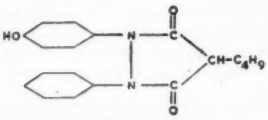
Hydroxyphenylbutazone

"Tanderil" (Geigy).

Chemistry.—The relationship between this drug and phenylbutazone is shown in the following formulae:



Phenylbutazone



Hydroxyphenylbutazone

Pharmacology. — Hydroxyphenylbutazone (G.27,202, metabolite I of phenylbutazone) was first discovered in the urine of patients receiving phenylbutazone, and was later synthesized. When administered to patients, it disappears slowly from the plasma, having a biological half-life in man of about two days, and is metabolized slowly but almost completely, only some 4% of the unchanged drug being recovered from the urine. It is absorbed from the alimentary tract, giving plasma levels similar to those obtained with phenylbutazone.

Therapy.—The main clinical use is in the treatment of the chronic rheumatic disorders—e.g., osteoarthritis, rheumatoid arthritis, and ankylosing spondylitis—when its even action over the 24 hours gives in many cases greater ease from painful symptoms than the shorter more interrupted action of salicylates. Its action in this respect is like that of the parent substance, phenylbutazone. In comparison with that drug, hydroxyphenylbutazone appears to be slightly less effective but less productive of gastro-intestinal side-effects. Dosage for these diseases is 200–600 mg. daily, the tablets being taken with meals in the lowest dosage which proves effective. The drug is also useful in treating patients with acute gout. Initial daily doses of 600–800 mg. may be given, dosage being rapidly reduced as the condition comes under control. It is not used as a uricosuric agent in the treatment of gout between attacks. It is useful for treating a number of other painful conditions, ranging from acute iritis and superficial phlebitis to Paget's disease of bone and metastatic malignant disease of bone. Its action in man is essentially in relieving pain, though it is also an effective antipyretic.

Toxic Effects.—As with phenylbutazone, dyspepsia, malaise, rashes, buccal ulcers, and oedema may occur. Although less likely to produce gastro-intestinal upset, this does sometimes occur. As this is a pyrazole compound, leucopenia may be a rare, but serious, complication.

N.H.S. Basic Price.—100 tabs., 32s. 10d.

(*Continued from previous page.*)

a comfortable angle which will rest the back. Removal of the telescopic legs makes it possible to fit the chair in the boot of a car for transport.

The "stand-sit" chair is easily moved about the house, enabling many household tasks to be conveniently carried out—for example, ironing, dish-washing—and allowing the occupant to view television.

The prototype chair in the illustration was ordered by the Welfare Committee of the Wiltshire County Council, on the recommendation of Dr. C. D. L. Lycett, the medical officer of health, to suit the requirements of a patient in their area.

I am indebted to Dr. R. D. C. Hart, of Wootton Bassett, the patient's doctor, for his interest in the design.

The "stand-sit" chair was made by Amesbury Surgical Appliances, Amesbury, Wilts, to my design, and cost £17 approximately.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

White Mouse Medicine

SIR,—In an article under this heading in *Family Doctor* of October, Sir Heneage Ogilvie launches a remarkable attack on clinical scientists in general and in particular on one or two medically qualified persons who are "not doctors in the practical sense" but yet have dared to express views on coronary thrombosis and diet. His article is presumably not meant for doctors whether practical or not; I have been unable to find this journal in the library of the Royal Society of Medicine. But it received wide publicity in some of the less responsible newspapers and is likely to mislead anyone who takes it seriously, because so many statements in it are false.

We need not bother much about the general innuendo against the use of lower animals in medical research. Pasteur, Lister, and Koch used them, hence antiseptic surgery; Minkowski's and Banting's dogs gave us insulin, and Whipple's dogs liver extract and hence vitamin B_{12}; the white rat was used by Hopkins in his discovery of vitamins, and Medawar's discovery of how to give a white mouse brown skin has justly earned half one of this year's Nobel Prizes and might be the clue to the method of transplanting tissues and so vastly extending surgery.

Sir Heneage believes that the cause of coronary disease "is simple lack of exercise." He attacks an earlier article in the same journal (May, 1960) by Dr. John Bradshaw in which the case for certain fats being harmful and others helpful was clearly presented; Dr. Bradshaw kindly asked for my comments on his article before it was submitted. Sir Heneage quotes two statements about helpful and harmful fats, allegedly made by Dr. Bradshaw, in order to attack them, but neither will be found in Dr. Bradshaw's article. As they do occur in articles of mine I am delighted to take full responsibility for them, even if this means I "would probably be unable to distinguish a coronary thrombosis from a perforated duodenal ulcer." Incidentally, my mice fed harmful fats get duodenal ulcers, and there are reasons I have given elsewhere for believing dietary fats play an important part in the cause of duodenal ulcers in man.

Sir Heneage states that the literature linking wrong dietary fats with coronary heart disease "is all theoretical." Perhaps then his reading has not been wide. In the very practical trial conducted by Dr. Torben Geill[1] deaths from coronary heart disease (and from other thrombo-embolic episodes) were greatly decreased in old people by removing butter, lard, and margarine from the diet and substituting an equal amount of corn and soya-bean oils; exercise was no different in the control and experimental groups. Sir Heneage, having "long believed that the secret of health is the consumption of animal fats limited only by repletion," assures us that at the age of 73 he "suffers from no identifiable diseases." His freedom from dental caries is commendable, but neither this nor the absence of coronary heart disease can necessarily be attributed to exercise, butter, bacon, and beef fat. He tells us the Eskimo "has to work hard to get rid of"

the fats he eats; I have studied the Eskimo, and just before Sir Heneage's article appeared was visiting Stefansson (who is mentioned but misspelt by Sir Heneage), who could assure Sir Heneage that the Eskimo is not especially active in winter though he sweats a lot. Sir Heneage tells us that "the Americans get more coronaries than any race in the world . . . and never use their muscles if they can help it." Are Sir Heneage's fellow-Scots in Scotland even less active, since according to the latest available figures (for 1957)[2] the mortality per 100,000 from arteriosclerotic and degenerative heart disease (B 26) was 346.4 for Scotland and only 302.4 for the U.S.A.? Another remarkable statement is that Americans eat far less butter than any other race in the world. If Sir Heneage had studied true Eskimos he would have been surprised to find they do not know what butter is, since the Arctic, like most parts of Africa, is particularly deficient in cows; and most schoolboys were taught that certain races in India do not customarily eat butter. In 1956 the consumption of butter in the U.S.A. was 9.1 lb. (4.13 kg.) per head of population and was less even in a butter-producing country such as the Netherlands (6.5 lb.) (2.95 kg.). In East Finland the agricultural and lumbering population eat much butter, are very active physically, and have a very high incidence of coronary thrombosis (and peptic ulcers); the incidence of both is much lower in the less active Western industrial population of Finland, who, incidentally, eat less butter. So much for "simple lack of exercise."

The most remarkable aspect of Sir Heneage's article is not the wrong facts or the attack on medical scientists, but the attack on the pharmaceutical industry: "But round the brainwave of this unsung scientist . . . one of the biggest commercial rackets of the pharmaceutical industry has grown." It is not my place to defend this industry against libels, but I can testify to the responsible way in which various members of the pharmaceutical and food industries have approached this problem; one such firm is losing a large sum annually on its products which members of the medical profession have encouraged it to produce, and another has spent about £2½m. in developing a food from which it expects to see very little profit.

Sir Heneage once wrote in an article entitled "Whither Medicine?"[3] as follows: "The science of experimental medicine is something new, and, to those brought up in the Hippocratic tradition, something sinister." This does not imply he himself finds it sinister, since the Hippocratic Oath expressly prevents those who subscribe to it from practising surgery. But before he attacks experimental medicine he should verify his facts.—I am, etc.,

Oxford. HUGH SINCLAIR.

REFERENCES

1 Geill, T., Hansen, P. F., and Lund, E., *Nature (Lond.)*, 1960, **185**, 330.
2 *Epidem. vital Statist. Rep.*, 1960, **13**, 12.
3 Ogilvie, Sir Heneage, *Lancet*, 1952, **2**, 820.

Vitaminized Cordials and the Teeth

SIR,—I should like through your columns to bring to the notice of the profession the disastrous effects of so-called "vitaminized" cordials and syrups upon the dentition of children. This problem has been mentioned from time to time in the medical and dental literature,[1-4] but we still see many cases where it is apparent that the profession is not conversant with this aspect of child health.

From my experience it would appear that many mothers are recommended by both medical practitioners and health visitors to take large quantities of vitaminized syrups and blackcurrant cordials, I presume to provide adequate supplies of vitamin C. It is even claimed by some that this will improve the state of the dentition! The effect of excessive intake by mouth of these substances, either on dummies, "dinky"-type feeders, by bottle or cup, has to be seen to be believed. The effect most frequently appears in the deciduous dentition, but by no means infrequently in the permanent teeth. I see numerous young children in their third and fourth years with the crowns of the teeth completely destroyed by acid erosion and caries, and with multiple chronic abscesses pointing on to the gingivae.

It seems a pity that the profession has to aid the work of the manufacturing companies in selling these substances. Surely if a child is in definite need of additional vitamin C after the eruption of the deciduous dentition it can quite harmlessly be supplied as tab. ascorbic acid B.P.—I am, etc.,

Royal Dental Hospital, London W.C.2. G. B. WINTER.

REFERENCES

1 James, P. M. C., and Parfitt, G. J., *Brit. med. J.*, 1953, **2**, 1252.
2 —— —— and Falkner, F., *Brit. dent. J.*, 1957, **103**, 37.
3 Holloway, P. J., Mellanby, M., and Stewart, R. J. C., ibid., 1958, **104**, 305.
4 *Brit. med. J.*, 1958, **2**, 293.

Recognition of Intoxication

SIR,—Recently there appeared in the press a report of a doctor who was bitterly attacked whilst appearing for the defence in a "drunk in charge" case. As one who has some experience of these cases I feel that it is time attention was called to the very unsatisfactory nature of the evidence adduced by the prosecution in many of these cases. Where the accused is really drunk and incapable medical defence evidence is seldom called. The cases of which I write are those in which it is not suggested that the accused was drunk, but rather that he had consumed that "little drop extra" which impaired his judgment and co-ordination sufficiently to render him incapable of having proper control of his car.

My first criticism is that the police nearly always state that the accused was "glassy-eyed and staring." This statement is nearly always palpable nonsense. We all have experience of social occasions, even B.M.A. ones, where some of our companions have taken one or two "extra." They may even have slightly slurred speech, but *never* do they have glassy staring eyes. This condition, when it occurs, is indicative not of early intoxication but of incipient alcoholic coma. The police surgeon's duty is to discover whether the accused has sufficient judgment and co-ordination to control a car. This is fairly and best achieved by simple reasonable tests such as gait, writing and copying, undressing, picking up money, etc.

The B.M.A. has issued a handbook on the recognition of intoxication[1] and, whilst this is careful to point out that the picture must be viewed as a whole, it lists certain signs as suggestive of intoxication. Many police surgeons produce these signs as though they were the Laws of the Medes and Persians. Take the rapid pulse. In an emotional and perfectly sober individual the circumstances of arrest and examination may well give rise to a pulse rate of 100 or even more. I have heard sluggish reflexes stated to indicate excess of alcohol. As reflexes in normals can

vary from the almost unobtainable to the excessively brisk this statement is totally unjustifiable. Finally, nystagmus. If the eyes are taken too far laterally to the point of strain normal persons will exhibit nystagmoid flicks.

Being interested, I have conducted many tests on people I have known to have taken "the extra one or two." Never yet have I found nystagmus. I would regard true nystagmus as being in the same category as glassy eyes and indicating a gross degree of drunkenness and incoordination.

If these irrelevant pieces of "evidence" were omitted and the medical opinion based on everyday tests of judgment and co-ordination, not only would the courts not be misled but some of us would be spared the embarrassing situation of having to enter the witness box and disagree with our colleagues.—I am, etc.,

Southsea, Hampshire. J. C. PRESTWICH.

REFERENCE

[1] *Recognition of Intoxication*, 2nd ed., 1958. B.M.A., London.

Service Overseas

SIR,—Recent correspondence in the press and the *British Medical Journal* has focused attention on the world-wide need of medical care, and in particular on our duty to our friends in former Colonies. Suggestions have been made as to "seconding" for a few years young men selected as being of professorial status and promise.

Sufficient emphasis has not been laid on the need for physically fit young medical men willing and able to tackle any reasonable work and to spend many years abroad. When the Colonial Medical Service was destroyed, more than a name was lost. What inducement can now be offered to young men and women to go out to carry the torch? Time spent in general practice or away from a teaching centre is likely to affect adversely any chance of advancement. Thousands of young people leave Scotland each year to go throughout the Commonwealth. There is no lack of the spirit of adventure, but there must be opportunity of happy employment.

I suggest a start should be made to build, finance, and staff "British hospitals" in the former Colonial territories. These hospitals, open to all, to be administered in collaboration with the home Government and teaching centres. In time this could become a United Nations responsibility and our young people could be given encouragement and fresh impetus to service.—I am, etc.,

Edinburgh 10. JOHN HARKNESS.

False-positives with "Phenistix"

SIR,—Dr. C. P. O'Toole (November 5, p. 1382) has performed a useful service in re-emphasizing that urine from patients receiving phenothiazine drugs may give a positive result with the "phenistix" reagent strip test for phenylketonuria. In a study of various tests, including phenistix, for the detection of phenothiazines in urine (the details of which it is hoped to publish shortly), specimens were tested from 329 psychiatric patients, 297 of whom were receiving these drugs. In 15% of these patients the grey to grey-green colour of the 15–40 mg. range of phenylpyruvic acid was obtained with phenistix, and in a further 15% a purple colour was produced. Nellhaus[1] also has drawn attention to the latter phenomenon, which he suggested might be used as a test for phenothiazines. However, in our experience only promazine was detected in this way with any regularity (28 positive out of 40 cases), no detectable change occurring with phenistix in 70% of our total phenothiazine series.

Dr. O'Toole's failure to obtain a positive ferric chloride reaction in the patients taking chlorpromazine is not surprising in view of the known instability of the colour reactions produced by phenothiazines, but a 4:1 mixture of 10% sulphuric acid and 5% ferric chloride gives a relatively stable colour, especially with chlorpromazine and promazine.[2]

Nevertheless, phenistix is a valuable screening test for phenylketonuria in babies in whom it is not always easy to collect sufficient urine for the more elaborate tests. In adults a positive result for phenistix can only be accepted if the patient has not been taking phenothiazines for at least a week, but in such patients confirmation should be obtained by paper chromatography, which is now a routine procedure in most of the larger clinical pathological laboratories.—We are, etc.,

S. GOLD.
P. D. GRIFFITHS.
R. G. HUNTSMAN.

Guy's Hospital, London S.E.1.

REFERENCES

[1] Nellhaus, G., *J. Amer. med. Ass.*, 1959, **170**, 1052.
[2] Forrest, F. M., Forrest, I. S., and Mason, A. S., *Amer. J. Psychiat.*, 1958, **114**, 931.

Congenital Ichthyosis, Spastic Diplegia, and Mental Deficiency

SIR,—Dr. B. W. Richards (September 3, p. 714) publishes the first report of this condition in an English subject, and his account derives added interest from the recent finding of Sjögren and Larsson[1] that the ancestry of 21 of 24 Swedish examples had been traced to a few families originating in a fairly restricted area in the County of Wasterbotten. The authors concluded that some 600 years ago there occurred the single gene mutation responsible for the great majority of their series. Dr. Richards's report may initiate the collection and study of cases in this country and we accordingly subscribe a further example:

Present Condition.—Male. Age 7½ years. Born February 18, 1953. Generalized congenital ichthyosis with pigmentation. Spastic diplegia. Mental retardation with I.Q. less than 30. Weight 36 lb. (16.3 kg.). Length: 38 inches (96.5 cm.). Unable to sit up alone but can maintain a sitting position with head and spine flexed forward after legs have been passively crossed and back raised. Knees held in flexion and ankles in plantar flexion. Tongue out. Head movements slow and weak. Given time can pick up small objects, build bricks, and feed himself. Says few single words. Six teeth. Arms and legs hypertonic with brisk reflexes. Adductor spasm of the thighs. Abdominal reflexes absent. Plantar reflexes variable. Not deaf. Vision appears normal. No evidence of cranial nerve palsy.

Perinatal History.—First-born of 28-year-old mother and 31-year-old father. Healthy pregnancy. 35-week gestation. Delivery in hospital on account of ante-partum haemorrhage. The maternity hospital records report: (*a*) eight-hour labour, vertex presentation, and spontaneous delivery; (*b*) birth weight 4 lb. 11 oz. (2.1 kg.). Onset of breathing at 1–2 minutes and of crying at 3 minutes; (*c*) a dry, thickened, inelastic skin; (*d*) at 4 days of age a diagnosis of congenital ichthyosis by Dr. Doris Fletcher; (*e*) at 9 days of age the recognition of flexor spasm at the elbows. Subsequent progress was that of a mentally retarded spastic child without progression of signs or symptoms. At 2 years, 13 teeth extracted, the dentist concluding that there was a constitutional enamel defect. At 3 years there were

several convulsions with fever. At 5 years Mr. A. B. Nutt suspected macular degeneration, a feature reported in three of the Swedish series.

Family History.—No known parental consanguinity and no history of ichthyosis, mental deficiency, or cerebral palsy. The mother and father were one of 12 and 3 sibs respectively and the patient has 21 cousins. Maternal grandmother had a stillbirth. The parents, grandparents, and four of the great grandparents are said to have been born near the Yorkshire-Derbyshire border.

—We are, etc.,

The Children's Hospital, Sheffield 10. T. COLVER. JOAN T. GRAHAM.

REFERENCE

1 Sjögren, T., and Larsson, T., *Acta psychiat. (Kbh.)*, 1957, Suppl. No. 113.

Trichophyton Sulphureum Infection

SIR,—We agree with D. W. R. Mackenzie and his collaborators, in their article on "Trichophyton Sulphureum in a Residential School" (October 8, p. 1055), that the presence of a long-standing focus of infection must have formed a great obstacle to rapid eradication of the epidemic they dealt with, but there are other possible delaying factors. To illustrate these as well as to recall what had to be accomplished before the advent of griseofulvin, we would refer briefly to a minor epidemic of a similar nature in a boys' residential school which we eliminated successfully under the supervision of Dr. A. Girdwood Fergusson, physician in charge of the department of dermatology at Stobhill General Hospital, Glasgow.

The first cases were seen during May, 1958, when four boys attending at the out-patient department were found to be suffering from tinea corporis. Two of them showed positive findings on direct microscopy, and in both cases *T. sulphureum* was grown on culture. The other two patients were sent as contacts showing signs suspicious of the disease, and, although the diagnosis was confirmed clinically, mycological findings were negative. Two cases of tinea capitis were also referred from the school, one in June and the other in September, 1958, both being positive on microscopic and cultural examination. Yet another contact was diagnosed clinically as tinea corporis in October, 1958. All these cases were admitted to the department of dermatology and they were not discharged from the ward until the infection had cleared or suitable facilities for segregation had been made available in the school.

Towards the end of October, 1958, it became obvious that it would be necessary to institute measures for the eradication of the epidemic. The medical officer visiting the school was asked to scrutinize carefully pupils coming in for the first time; all those in the school with lesions suggestive of tinea were segregated pending inspection by a dermatologist, and at the earliest opportunity we made a complete survey of the 93 inmates, each one being examined unclothed in a good light. Five suspects were sent to hospital for further investigation, and of these one was a case of previous tinea corporis, now inactive; three were pyococcal infections; but one, a boy of 16 years who had been resident in the school for 18 months, had alopecia following tinea capitis. Apart from possible disintegrated fungi on microscopical examination of one hair stump from the edge of a lesion, there were no positive findings in this case, but it is tempting to speculate that the infection may have resolved during his residence, and that it may have been the cause of the epidemic. Local applications were applied, no further activity was observed, and he was discharged, and in the two years which have now passed since then there have been no new infections in the school.

The ease with which this epidemic was eradicated when all known cases were segregated in addition to being treated—tinea corporis by local applications and tinea capitis by *x*-ray epilation and local applications—points to the importance of segregation. Too often in the past, enthusiasm over new methods of treatment has led to neglect of this precaution in a chronic infective disease, and it would be a disservice to the reputation of griseofulvin to demand from it more than it can accomplish. Much more evidence regarding its efficacy, therapeutically and in prophylaxis of tinea of different regions of the body and at different stages of activity, will be required before it can be relied upon to eradicate an epidemic without simultaneous strict segregation of infected cases.—We are, etc.,

Stobhill General Hospital, Glasgow N.1. JAMES C. P. LOGAN. P. DERBLAY.

Coronary Artery Disease

SIR,—Your leading article on coronary artery disease (November 5, p. 1370) refers to the part mechanical damage may play in initiating atherosclerosis. In a series of arteriographies on the lower limbs of cadavers,[1] a case was encountered in which the arteries on one side were atheromatous whilst on the other the vessels were almost devoid of such change. The limb on this latter side had been wasted since infancy (the patient was elderly) as a result of a tuberculous hip, and it was thought that the arteries had escaped damage because of their diminished function, hence the lack of atheroma. We thought it a very good demonstration of the importance of mechanical factors in the pathogenesis of atherosclerosis.—I am, etc.,

Woking and Chertsey Group Laboratory, St. Peter's Hospital, Chertsey, Surrey. C. F. ROSS.

REFERENCE

1 Ross, C. F., and Keele, K. D., *Angiology*, 1951, 2, 374.

Frightening the Patient

SIR,—There are still some who hold that electro-convulsive therapy is more likely to benefit the psychiatrist's latent sadistic trends than his patients. Part of their scepticism and mistrust stems from the unfortunate choice of nightmarish terms such as "electro-shock," reminiscent of torture chambers. Little has the term "electro-convulsive" contributed to allay the public's suspicion. The next choice, namely "plexy" (meaning stroke), is not very reassuring either, its only redeeming feature consisting in the public's ignorance of Greek.

Unfortunately these awe-inspiring terms are well known to the public, and thus, when the need for this very effective therapy arises, the psychiatrist is often confronted with a patient loaded with fear. In these days most mentally-ill patients are admitted voluntarily and consent for treatment by relatives no longer applies; their own permission is required. To make things worse, some mental hospitals have retained old-fashioned consent forms, dating from the days of straight E.C.T., the wording of which in some instances is more apt to act as a deterrent than an inducement to treatment. It is therefore not surprising if some patients, already frightened as they are, refuse their permission after reading about the various risks and hazards. Some of these consent forms add in a postscript that no assurance can be given that the treatment will be carried out by the patient's usual attendant. Though this measure is dictated by shortage of staff, treatment by proxy—

especially in psychiatry—is clearly far from satisfactory. As can be seen, all the odds are against the patient.

Although E.C.T. is a physical form of treatment, there is no need to discard basic psychotherapeutic principles in administering it. With the advent of muscle relaxants, the risks of injury to which the old consent forms refer have been considerably lessened. Convulsions can be reduced to a flicker. It is not denied that the shock of the organism, due to sudden release of excessive acetylcholine, still takes place; but in the absence of the violent motor component the term "convulsive" is no longer correct, and the "shock" somehow less shocking.

To frighten the public is the last thing psychiatrists desire, especially as the only kind of patient likely to benefit from these frightening names and preliminary administrative procedures is the one for whom E.C.T. is not meant—the hysteric. I suggest, therefore, that (1) the wording of fear-inspiring, out-dated consent forms should be brought up to date; (2) so far as possible E.C.T. by proxy should be avoided; and (3) less awe-inspiring terms, such as electro-flicker or electro-fasciculation therapy, should be used.—I am, etc.,

Storthes Hall Hospital, Huddersfield. D. H. ROPSCHITZ.

Mental Health

SIR,—The patients seeking the aid of general practitioners are unselected. Their mixture of mental and bodily disorder may be in any proportion. A general practitioner more than anyone else, therefore, given reasonable experience and insight, cannot fail to abandon mind–body dualism from his thinking, if ever influenced by it. Mind–body dualism is a tempting over-simplification to those concerned with medicine mainly as a science and only to a small extent as an art, however.

Nevertheless, it is difficult to conceive any disagreement with Dr. W. Alan Heaton-Ward (October 22, p. 1237) that the highly specialized, in-patient care of the mentally subnormal is work for other than a whole-time psychiatrist. But, while there is any hope of the patient leaving the "therapeutic community" for the community outside, interest by the general practitioner should be a help in the ultimate rehabilitation.—I am, etc.,

Barton-on-Humber, Lincs. S. H. F. HOWARD.

Psychiatric Seminars

SIR,—In your leading article on the Mental Health Act (October 29, p. 1297) you state that "Better education in psychiatry in the undergraduate years and refresher courses afterwards will help the general practitioner of the future." Will this help be enough? Those practitioners who have attended refresher courses in psychiatry find that they only obtain an answer to a fraction of the mental health problems that beset them in their practices.

The general practitioner wants to learn how to handle *his own cases*, and he can only do this through a seminar where he can bring his cases up for discussion amongst his colleagues with a psychiatrist as leader. At present this form of postgraduate education is only available in London at the Tavistock Clinic from Dr. Balint and his colleagues, and in a few other centres in the country. It is time the Postgraduate Medical Federation recognized the value of these courses and gave them official recognition, so that they could be included in their programmes for postgraduate education.—I am, etc.,

London W.8. H. STEPHEN PASMORE.

Psychiatry in General Practice

SIR,—Dr. Paul Mestitz (October 29, p. 1313) is right to quote one of Dr. Michael Balint's main precepts that the most powerful drug which the doctor uses is himself. But, like so many quotations, its full meaning is lost through being incomplete. In his book, *The Doctor, his Patient and the Illness*, Balint goes on to explain that the drug "doctor" is far from standardized, and that, although patients can apparently benefit from all varieties of the drug, nevertheless "this does not mean that each variety is equally beneficial." Certainly, in my experience, and I write with all humility, the drug "doctor" prescribed in doses of half-hour sessions for the treatment of the whole patient is far more effective in many groups of patients than would be the drug "doctor" prescribed in tablet form.

Surely all but the most sceptical must agree that so long as the cause of the underlying symptoms is left untreated, whether it is the inflamed appendix in appendicitis or the tense emotional state in the psychoneurotic or stress disorder, the patient can hardly be expected to recover. Symptomatic treatment in both cases is only second-best treatment. In your leading article on the Mental Health Act (October 29, p. 1297) you state that the family doctor has much to contribute in the "community" services for the mentally ill, and, while I welcome this comment, I fear that it cannot be fulfilled until we all accept the prime importance of emotional factors in the aetiology of much of the illness seen in general practice.

Your reference to the need for "better education in psychiatry in the undergraduate years and refresher courses afterwards" is timely, and I sincerely hope that those responsible for such training will be permitted to exert their influence at the right time and in the right place. This must necessarily include instruction of other medical teachers to teach their own specialties in proper perspective, and to make them more aware of the actual needs of the family doctor and his patient.—I am, etc.,

London N.W.3. PHILIP HOPKINS.

REFERENCE

[1] Balint, M., *The Doctor, his Patient and the Illness*, 1957. Pitman. London.

Preventive Medicine

SIR,—How refreshing it was to read Dr. R. Thorne's letter (October 15, p. 1162) on the value of preventive medicine. It appears to me that the history of medicine could well be divided into three periods. Firstly—the age of discovery, covering the period from primitive man to Lister. Secondly, the period of progress and consolidation, from Listerian times to the end of the second world war—with its consequent discoveries in the field of antibiotics. Finally the present age, when medical science has the curative answer to most diseases, with notable exceptions such as cancer and leukaemia.

It would appear logical now, armed as we are with the knowledge of centuries, to turn more to the prevention of disease. We have a vast amount of information at our disposal, indicative of the why and the wherefore of many

diseases, and we know that preventive measures can be taken against them. This, in particular, relates to diseases caused by micro-organisms. Nowadays, any qualified doctor can treat established disease, and any surgeon can excise or repair diseased tissue. It is no more, nor less, than technical skill. I doubt, however, if it contributes greatly to the overall development of medicine—rather it is analogous to the work of any maintenance staff employed to keep any structure in repair. While maintenance plays a big part in any organization, it is, nevertheless, *not* by any means the important thing that makes for progress. I submit that greater stress must be placed on the importance of preventive medicine. This is the New Era. Doctors should be trained not only in technical "know-how," but in such a manner as to make them visualize medicine on a wider basis—embracing all mankind. To do this will require some reorganization of thinking at professional level. In truth, the present system of medicine and surgery may have a "fattening" effect on personal income without contributing greatly to the common good. Successive governments must shoulder a fair share of responsibility in the matter. Preventive medicine has always been the Cinderella of medical politics. It has no vote-catching appeal. The National Health Service cost £647m. last year and the only income was £92½m. received from contributions. It is certain that the scheme would be less costly than £12–£13 per head of population were more money initially detailed to the study of preventive methods. There is a big field of research to be covered in the study of health in relation to occupation. So far, excluding the industrial diseases, any work done on these lines has been mainly of a voluntary nature, and without the assistance of public funds.

Doctors are nowadays in reality in a paradoxical position. If it be accepted that a doctor's function is first to cure disease, then the faculty has not progressed very far from the days of the leech and the barber-surgeon. A doctor's real job is to keep those under his care as healthy as possible and free from disease. This he can do by reorientating his thinking, and using his surgery, not, as at present, for the reception of the sick but as a place of check-up and advice. The amount of knowledge at his disposal is great; the diagnostic facilities are available. If a sufficient number of persons are seen in annual check-ups, standards of normality may be worked out, and deviationists could be more closely investigated. The early signs of the more serious diseases would then be discovered, and the preventive measures applied. In particular, the following diseases suggest themselves as being worthy of mass investigation: Hypertension, coronary disease, nephritic conditions, cancerous conditions, bronchitis, asthma, neurological disorders, anaemias, and the rheumatisms.

The emphasis must be on the health-centre idea, and away from the surgery or dispensary. Times have changed, but medicine is mainly reactionary and traditional. I realize that all this has been said many times before, and most of the universities have appointed professors of social medicine. This is a start in the right direction, but, alas, the professors of medicine and surgery often look upon these new men as they would creatures from outer space. In conclusion, I must emphasize that the future of medicine depends on accepting the preventive outlook. This breaks with tradition, and will not easily be achieved.—I am, etc.,

Navan, Ireland. ANTHONY EUSTACE.

Fringe Medicine

SIR,—We are grateful for your reasoned editorial comment (October 29, p. 1299) on Geoffrey Murray's survey of "fringe medicine" in the *Spectator*. But in one respect it is puzzling. You begin by quoting Sir James Paget's advice to his Bart's colleagues 80 years ago—that if they did not learn how to manipulate their patients they would lose them to the bonesetters; and you recall the profession "almost canonizing" Sir Herbert Barker in 1936. But where are the profession's manipulators to-day? You cannot really blame the patient for turning to unqualified practitioners, osteopaths, and chiropractors for manipulation if he cannot find it in the N.H.S.

And this is why your advice to qualified practitioners—that they may have something to learn from fringe medicine—is timely. You hint that it was unwise of us to be dogmatic about the numbers of patients deserting orthodoxy for unorthodoxy, and of course it is hard to obtain reliable figures; but the evidence we had pointed to an increase in the treatments given by *organized* fringe groups (which were all that Mr. Murray was concerned with). The reason is surely obvious: that much of the ill-health that troubles people to-day is not easily managed by orthodox methods. Manipulation is only one case: it is not "scientific"—not, at least, when practised by a Barker, who was unable to describe what he was doing, being an artist rather than a craftsman. The psychotherapy required for understanding and helping patients with psychotic, neurotic, hysterical, and psychosomatic disorders (and probably for most of those which used to be described as functional) cannot be taught (not, at least, if Freudian or Jungian methods are adopted) in quite the same sense as other forms of treatment can be taught—even if the curriculum allowed the time. As for "healing," it cannot be taught at all.

Is there not a good case, therefore, for a greater degree of flexibility? One of the most significant aspects of Mr. Murray's survey, it appeared to us, was the way it revealed the illogicality of the present position. A layman finds it hard to understand why homoeopathy should be "in" while osteopathy is "out." Is it not time the frontiers were redrawn—perhaps with the assistance of legislation comparable to the recent Professions Supplementary to Medicine Act?

The obvious difficulty, to which you refer, comes from the fact that doctors see the harm done to patients by unqualified healers, and "have seen so much charlatanry among them." But surely the way to deal with crooks and charlatans is to provide organized and reputable fringe groups, some of whom have already put their houses in order, with recognition, enabling the public to distinguish between bona-fide unqualified practitioners and charlatans, instead of lumping them all together as quacks. Mr. Murray suggests the establishment of a court empowered to examine the various groups and give licences; it could provide the required protection for the public.—I am, etc.,

BRIAN INGLIS,
London W.C.1. Editor, *The Spectator*.

SIR,—Every sensible person prefers to go to a doctor for medical treatment. This preference is obviously reinforced when the treatment is available free of charge in the Health Service, but only by payment from laymen. The question raised by your annotation (October 29, p. 1299) and by *The Spectator* (October 28, p. 644) is: why do osteopaths, chiropractors, and bonesetters flourish in this country? The answer is that they purvey a useful method of treatment neglected by doctors.

In my view there would be no lay manipulators if all those patients who would benefit from manipulation—particularly of the spinal joints—were to receive it on the spot from their own doctor, or at the first hospital to which he sent them. As *Time and Tide* (November 5, p. 1320) points out, Sir James Paget's 90-year-old warning has proved amply justified, and patients—suited and unsuited—flock to lay manipulators. (The word

"flock" is no exaggeration; for it has been estimated that one such self-styled layman exists for each ten family doctors.) Without medical training, these men have no means of telling who needs manipulation and who does not; moreover, they would impoverish themselves severely if they did learn. But, however small may be the proportion of patients attending who really need manipulation, it is common knowledge that dramatic successes on this fraction are no rarity. In principle, any patient cured by manipulation by a layman should never have reached him; he should have been put right previously by the same method carried out under the medical aegis. Since manipulation is a technique required by every family doctor in the course of his daily round, all medical students should be grounded in this work. This has been the practice at St. Thomas's for the past 15 years, and many of our graduates have reported favourably on this tuition.

Patients with joint disorders, especially of the spine, are often sent to physiotherapists. Such students should therefore be taught these manœuvres in detail, as has been the policy at St. Thomas's ever since Dr. Mennell was appointed in 1916. Following the example of Norway, a register should be compiled of manipulating physiotherapists. Over there, in order to curb the growth of lay manipulation, the relevant authority in their health service decided, five years ago, to send a physiotherapist over to St. Thomas's to learn the work. On his return he taught a group of others, who were later examined by a Norwegian consultant and myself. The successful candidates were put on a list to which doctors seeking such treatment could refer. The same authority found the rate of recovery in some disorders so much accelerated that, after a year's experience, the service offered twice the fee for a session of manipulation as for ordinary physiotherapy.

There can be no doubt that, given a few years' universal grounding of medical and physiotherapy students in this work, lay manipulation would die out in this country. It is no good deploring lay manipulation without providing a proper alternative. Lay manipulation has come into being as a response to public demand to fill an important gap in medical practice. It will cease only when patients find this measure available in suitable cases from their own doctor, or, at his request, from a physiotherapist trained in this work. In theory this presents no difficulty; what has been done for years at St. Thomas's can equally well be taken up at other teaching centres. Quite apart from the relief of avoidable human suffering, such tuition would be found to benefit the finances of the Health Service in this country, no less than has already been found abroad. It seems only just that these advantages should now be extended to patients living in the country where the methods were worked out.—I am, etc.,

London W.1. JAMES CYRIAX.

Soap and the Skin

SIR,—Dr. L. B. Bourne's letter (October 1, p. 1014) discussing the very excellent article by Dr. F. Ray Bettley (June 4, p. 1675) raised several points of view with which I, and, I know, many other dermatologists, are in strong disagreement. I thought that Dr. Bettley's meaning was quite clear when he said that "the presence of soap may be a more important factor in producing irritation than these various additives [free alkali, builders, antiseptics, etc.] which are often blamed." He was in fact saying that the property of soap in facilitating permeation of the epidermis was therefore the basic cause of the irritant properties which some of these additives possess, a statement which is in no way at variance with his earlier statement that a 5% soap and 5% potassium palmitate mixture had on the whole failed to irritate the eczematous skin.

Dr. Bourne's view that rubbing into the skin, several times daily, soap in the form of some of the commonest cheap barrier-creams does not increase the risk of dermatitis is really another way of saying that this is probably a possibility which he has not considered in the past, and, unless he can support this view with statistically unassailable evidence based on properly controlled trials, this remains, like the vast majority of the opinions which have supported over the years the so-called value of barrier-creams, "evidence" based on clinical impressions. These are always notoriously unreliable, and in this particularly difficult field are quite worthless. Of one thing we can be certain, that so far no statistically planned and properly controlled trial which has shown conclusively that barrier-creams have by themselves definitely reduced the incidence of dermatitis has ever been done.

The greatest virtue of Dr. Bettley's article was its insistence that we should be constantly critical, and there is no doubt that the vast mass of clinical work done on barrier-creams has been conspicuously lacking in this respect. I strongly agree with Dr. Bettley that the criteria for the diagnosis of industrial dermatitis of the primary irritant type are often highly suspect, and when one compares the incidence of endogenous eczema in different age-groups with that of cases of the so-called primary irritant dermatitis in similar age-groups and finds them virtually identical, this suspicion is further reinforced.

Finally, in the face of the work of Dr. Bettley and others, Dr. Bourne's view that the fact that thousands of workers daily use innumerable tons of soap-based barrier-creams without apparent trouble is evidence of their harmlessness would seem to be akin to that of someone who, 25 years ago, might have stated that since millions of cigarettes were smoked daily by millions of people without apparent harm, they must therefore be innocuous.—I am, etc.,

Princess Margaret Hospital, Swindon, Wilts. K. D. CROW.

Personal Record Cards

SIR,—I was interested to read the comments of Dr. John Riddell (October 22, p. 1239) on the use of personal immunization record cards, as I am at present experimenting with such a card. Further, Dr. Riddell's letter raises a far more important point—namely, the age at which prophylactic injections should be given.

In the same issue (p. 1251) your expert states "if the child is nearly a year old, the most dangerous period for whooping-cough is nearly over." It appears that the children of Midlothian and Peeblesshire remain unprotected against whooping-cough at the time when the disease is most deadly. In England and Wales during the years 1949–58 2,230 persons died as a result of whooping-cough. Of these 1,489 (66.8%) were under the age of 1 year.[1] Is it not reasonable to assume that some of these infants might not have died had they received an adequate course of injections of pertussis vaccine, alone or in combination, in the early months of life, starting at eight weeks or even earlier?—I am, etc.,

Flixton, Lancashire. R. SCHOFIELD.

REFERENCE

[1] *Registrar-General's Statistical Review of England and Wales for the Year 1958, Part I, Tables, Medical*, 1960. H.M.S.O., London.

Not a Day Too Soon

SIR,—November 1, day of the full promulgation of the Mental Health Act, 1959, has not come a day too soon for the peace of mind of those who had to wrestle with the moribund law in the following case:

A 26-year-old man was charged with breaking and entering a hotel and stealing wines, cigarettes and other commodities. After arrest he took barbiturate secretly, slept for 36 hours, was admitted to hospital, and there chewed a thermometer and swallowed part of a spoon. Later, in prison, he is alleged to have swallowed other articles of cutlery.

The magistrates' court remanded him in prison to Quarter Sessions, and, at this stage only, his psychiatric state being queried, the defence asked for a psychiatric report. The patient told the psychiatrist, who interviewed him on October 10 and 25, that he had broken into the hotel in response to the voice of his brother, at the time in another part of the country, ordering him to take revenge on the hotel for stealing his dog's leash when he had tea there that afternoon (the leash in fact having been left in the patient's car). Other paranoid material emerging, in conjunction with catatonia and thought disorder, a firm diagnosis was made on October 10 of schizophrenia, in which the prison doctor concurred, both doctors agreeing that the patient was certifiable as of unsound mind.

The psychiatrist, in deference to present-day principles of rehabilitation in schizophrenia, insisted that the patient would respond best to treatment near his home. However, if he was up before Quarter Sessions and certifiable, the only medical disposal considered open to the court was to Broadmoor, either on the ground of unfitness to plead or on a finding, after a plea of not guilty, of guilty but insane: the patient's local psychiatric hospital was unwilling to accept him as a Broadmoor patient, as it possessed no locked wards. Meantime, the patient having come to hear of these possibilities of Broadmoor and certification, wrote his solicitor a sane and coherent letter on October 23, asking to be allowed to go voluntarily to the hospital for treatment. The psychiatrist was therefore asked to re-examine the patient on October 25, and concluded that he was no longer certifiable on the ground that he had now enough insight to appreciate his need for treatment, although he remained actively schizophrenic. He agreed therefore to support the defence's submission that the right disposal was probation with a year's condition of residence in his local psychiatric hospital under Section 4 of the Criminal Justice Act, 1948: a disposal specifically precluded in the Act by certifiability.

At the trial on October 25 the prosecution, having curiously accepted the patient's fitness to make his plea of guilty, called in evidence the prison doctor, who insisted that the patient was certifiable and ought to be treated only under certificate. Had the court accepted this doctor's view, it could not have ordered psychiatric treatment, either in Broadmoor or elsewhere, because, firstly, the acceptance of the plea of guilty precluded both unfitness to plead and the bringing-in of a verdict of guilty but insane; because, secondly, higher courts had no jurisdiction to certify for ordinary psychiatric hospitals. Indeed, the court deliberated with counsel the possibility of adjourning the case till after November 1 so that a hospital order under Section 60 of the new Act could be effected. Otherwise, considering the grave nature of the offence and the patient's previously bad record, it would clearly have had no option but to sentence this patient, agreed by both sides to be severely ill, to prison, and hope, as it could not order, that psychiatric treatment would be afforded him there. In fact, the submission of the defence, with the psychiatrist in support, that the patient was not certifiable and suitable for disposal under Section 4 of the Criminal Justice Act, 1948, was accepted; and the patient is now under informal category in his local psychiatric hospital as a condition of a probation order. —I am, etc.,

Exeter. SEYMOUR SPENCER.

Marksmanship and Crossed Laterality

SIR,—Your correspondents' (October 22, p. 1239, November 5, p. 1386) cures for this problem are placebos of the worst kind. The art of gun-fitting, developed over more than a century and now unfortunately dying, is one in which England leads the world. Yet, surprisingly, it has received very little attention from the medical profession.

A shotgun is not aimed with the aid of sights like a rifle or fired from a stationary position. It is pointed towards a moving object, swung in relation to the flight of this object, and discharged while moving. The user looks at his target but never at his gun. The aim of the gun-fitter is to ensure that when a shotgun is mounted—that is, raised to the shoulder (the first step to becoming a competent shot is to acquire the art of mounting uniformly and correctly), it points in such a way that when discharged the shot pattern will centre on or just above the spot thirty or forty yards distant—both distances are used—at which the user was looking with his master eye when the gun was fired. In effect, when the shotgun is raised to the shoulder, the master eye should look straight along the barrels. To ensure this three factors must be correct, the length, bend, and cast off or on of the stock. It is obvious that when the butt of the gun is placed on the right shoulder much more cast-off is necessary to bring the barrels into alignment with left eye than with the right. When, therefore, a right-handed, left-eye dominant man is fitted for his gun the stock is specially shaped to allow for this peculiarity, and if the fitter is master of his art no difficulties at all arise.

The trouble is, of course, that many of us cannot afford, or imagine we cannot afford, to be fitted for a new gun. Most second-hand, first-grade guns and all the cheaper mass-produced guns, excellent though they may be in all other respects, are made for the average man who is right-handed and right-eye dominant. Such guns may have their stocks lengthened or shortened to fit the individual, and the gunsmith can even, within limits, alter the bend and cast-off, but the wooden stock will not stand bending to an extent sufficient to make them fit a left-eyed dominant man. In spite of this many such people own and attempt to use guns of this type. Some are content to shoot wretchedly—presumably they enjoy the fresh air and exercise. Others attempt to suppress their dominant eye: they wear spectacles with an opaque or partial lens on the left side, they affix messy little screens to their gun barrels, or stick up their left thumbs to achieve the same effect, or, commonly, they attempt to close or to wink their left eye when shooting (many with a dominant left eye have subnormal vision in their right and are highly unsafe when shooting one-eyed). The wise ones learn to shoot from their left shoulder, when their gun can usually be cast on to fit them, or else take the unsuitable weapon to a reputable gunmaker and trade it in either for a new one made to their own requirements or for a second-hand one with a "cross-eyed" stock which can be modified to fit them. Such guns are in limited demand and can often be bought relatively cheaply when they come on the market.

I apologize, Sir, for trespassing on your columns to some length in this matter, but I am sure that you would not wish to alienate any gunsmiths who may be regular readers of the correspondence columns of the *B.M.J.*—I am, etc.,

London W.1. J. R. ARMSTRONG.

SIR,—I was interested to read Dr. B. S. Phillips's letter (October 22, p. 1239) because he suggests that the phenomenon of the master or dominant eye is a characteristic of the individual—as, for example, is the colour of his eyes. I do not think that this is so.

I was taught to use a shotgun from about the age of 8, shooting with both eyes open. The results were not very satisfactory, and a finger-test showed left-eye dominance, which was not surprising, as I was left-handed but had learned to shoot off the right shoulder. I practised partially shutting the left eye, and in the course of time the finger-test showed right-eye dominance. In my 'teens I took up billiards, which I naturally played left-handed, and was told that I must shut my right eye since it was the master. I reversed the previous drill and soon the left eye was again master.

Many years have passed, and I have not considered the problem until I read Dr. Phillips's letter. On doing the finger-test now I find right-eye dominance using the right hand and left dominance with the left hand. I suggest that the phenomenon is entirely a matter of training, similar to that which allows a microscopist to study a different subject with each eye concurrently. I think that shooting with one eye closed must reduce efficiency, as would driving a car under a similar handicap. I suggest that the answer is to train the eyes in learning to shoot as the muscles are trained to manipulate the gun.—I am, etc.,

Weybridge, Surrey. J. W. F. LUMSDEN.

SIR,—We have read with interest letters from Mr. R. Merryweather and Dr. Maurice Birkbeck on this subject (November 5, p. 1386). It will interest your readers to know that for target-shooting on fixed ranges with small-bore rifles (.22 calibre), and service rifles (.303 calibre), a device has been produced to fix on the back-sight. This allows the firer to shoot from the right shoulder but to aim with the left eye. The device is a combination of prisms, and, provided it is accurately fitted to the rearsight, proves most successful to those shooting from the right shoulder whose left eye is their master eye.—I am, etc.,

A. J. PALMER,
Secretary,
London S.E.1 National Small-bore Rifle Association.

POINTS FROM LETTERS

Training of a Surgeon

Dr. JAMES F. BRAILSFORD, Treasurer and Secretary, British Isles and Commonwealth, International College of Surgeons, writes: On reading your account (October 29, p. 1305) of the discussion at the International Federation of Surgical Colleges, I was amazed that the work of the International College of Surgeons was ignored both here and by the American College of Surgeons, though given Government support in the majority of the countries of the world. This College was envisaged in the address of Sir William Lawrence, P.R.C.S., F.R.S., over 100 years ago—i.e., in his presidential address in 1817—but no Fellows of the Royal College of Surgeons took up his suggestion. It was left to Professor Max Thorek to do so in 1935. Since then it has spread to nearly every country, because it sets out to do just what this discussion claims to be desirable. In this world of rival claims it seems to be highly undesirable that a rival organization such as the International Federation of Surgical Colleges should be fostered in the country which has contributed so much to the progress of surgery, not the least being by its philosophy.

Obituary

W. E. R. DIMOND, C.I.E., C.B.E.
L.R.C.P.&S.I., D.P.H.

Major-General William Elliot Randall Dimond, who had a distinguished career in the Indian Medical Service, died at his home at Greystones, Co. Wicklow, on November 5.

G. R. McR. writes: Although it was known that General Dimond was suffering from a cardiac disability, his passing at the early age of 67 will be mourned by a host of friends both in and out of the profession.

Bill Dimond, after qualifying at Dublin in 1915, served in the R.A.M.C. from 1915 to 1918 mostly with front-line troops. He was wounded twice and was mentioned in dispatches. He obtained a regular commission in the I.M.S. in 1919 and served with military formations until 1925. In 1924 he obtained the D.P.H. On his return to India he was appointed to the civil side of the I.M.S. in the post of assistant director of public health of the North-West Frontier Province, an appointment which he retained until 1940, when he was recalled to military duty.

Dimond became almost a legendary figure in the N.W.F.P. Popular with all, Pathan and Indian alike, he performed his duties thoroughly and with great efficiency, but at the same time became deeply involved with the management and operation of the famous Peshawar Vale Hunt, of which he became master. Bill's well-known love of the horse and of open country made his period of mastership a notable one. He was succeeded in that office by his wife. His love of the N.W. Frontier, its peoples and its sporting facilities, led him to decline all offers of promotion as director of public health of a major province and appeared at one time to threaten further advancement, although he was appointed C.I.E. at an early age for conspicuous service in fighting a cholera epidemic.

His recall to military duty provided him with an opportunity to demonstrate his real ability when extended. He earned a high reputation in the Middle East as a hospital commander; on transfer to South-east Asia as, successively, A.D.M.S. of the 23rd Division and D.D.M.S. 4th Corps he was reported to be an outstanding success—and particularly when quick decisions had to be taken in difficult circumstances, as at the battle of Imphal. He was mentioned in dispatches again and was appointed C.B.E. for his services in South-east Asia.

In 1944 he was recalled to civil employment as Inspector-General, Civil Hospitals, Assam, and after a few months was promoted to be Major-General as Surgeon-General with the Government of Bengal. His arrival in Calcutta shortly preceded the outbreak of large-scale riots and bloody strife in the streets. Civil resources were strained to the uttermost, but Dimond contrived to make more than adequate use of his slender resources: not only so, but when widespread major slaughter broke out in the neighbouring province of Bihar he sent immediate help in a most generous way to a colleague (the writer) who was sore afflicted.

He retired in 1947 and was employed at the headquarters of the Ministry of Health in London until a year ago, when, because of a failing myocardium, he went to live in his native Eire. Dimond was married twice. He leaves a widow, a daughter, and a son who is a member of our profession.

C. W. A. KIMBELL, M.B., Ch.B., F.R.C.S.Ed. F.R.C.O.G.

Mr. C. W. A. Kimbell, gynaecological surgeon to the Samaritan Hospital for Women and obstetric surgeon to the City of London Maternity Hospital, died at his home on October 26. He was 55 years of age.

Claude Wilfred Alfred Kimbell was born in New Zealand on October 24, 1905, and was educated at Wellington College and at the University of Otago, where he graduated M.B., Ch.B. in 1930. He came to England soon after qualification to continue his postgraduate studies, and at first held a resident appointment at the Royal Sussex County Hospital and then the post of resident surgical officer at the Kent and Sussex Hospital, Tunbridge Wells. He then decided to take up the study of obstetrics and gynaecology, and held the posts of resident medical officer at the City of London Maternity Hospital and house-surgeon at the Samaritan Free Hospital. Later he was appointed registrar at the Samaritan Free Hospital, holding this post until the beginning of the second world war and returning to it in 1945. He was admitted as an F.R.C.S. of Edinburgh in 1935 and a Member of the Royal College of Gynaecologists in 1937.

R. C. B. writes: In 1938 Claude Kimbell joined the Territorial Army, and at the outbreak of the second world war he was one of the first to be sent to France. When Dunkirk was on the point of being captured, Mr. Kimbell had the opportunity of escaping to the boats on the beaches; in fact, his senior officer told him to do so, but this was not consistent with his conduct, which his friends knew and admired. He stayed behind with his patients, and was captured with them. He spent five years in German prisoner-of-war camps, and when he finally returned to England, although he must have suffered severely both physically and mentally during this period, one never heard him complain. Information about this part of his life had to be dragged out of him, and, when it was obtained, it was told in such a fashion that one might regard it as being a careless trifle in his story. When he was re-established in England he was soon appointed to the staffs of many hospitals. He became consultant surgeon at the Samaritan Free Hospital and consultant gynaecologist at the Prince of Wales' Hospital, Tottenham, and at the Wood Green and Southgate Hospital. He was also appointed consultant obstetric surgeon at the City of London Maternity Hospital and the Bearsted Memorial Hospital.

In 1953 he was elected a Fellow of the Royal College of Obstetricians and Gynaecologists. Later he became associate teacher at St. Mary's Hospital Medical School and associate examiner at London University in the M.B. examination. He was a skilled surgeon, and did much to develop and perfect the technique of major gynaecological surgery. All these activities, together with his private commitments and his interest and work as vice-president of the Section of Obstetrics and Gynaecology at the Royal Society of Medicine, kept Claude Kimbell very busy. The remarkable thing was that he was capable of doing this work, because for the last ten years of his life Claude Kimbell was an ill man and more or less constantly under medical supervision. Many a lesser man would have given it up and retired to a quieter life, but he preferred to die in harness.

Mr. Kimbell possessed the qualities of integrity, conscientiousness, and courtesy, but, far above all these, he was a man dedicated to service and kindness. Loyalty and friendship were to him of supreme importance, and I have never met in my whole career any man who would pay more detailed attention and devotion to all his patients. Day or night he was ready to help anyone. At times when he was really seriously ill, I have known him to get out of bed at night and spend many hours at hospital because it was his duty to do so. He was a true Christian, a natural gentleman, and a great surgeon. In Mr. Kimbell's death the world has lost much that it cannot afford to lose. He has left behind him, however, a tradition of service which many of us might try to follow.

Mr. Kimbell is survived by his wife and his son and daughter.

L. W. L. writes: I first met Claude Kimbell in the early 1930's when he was a resident at the Royal Sussex County Hospital. He was one of a series of exceptional New Zealanders who came to this country for postgraduate work and remained for their life's work. Kimbell was then, as always, an idealist. He set the highest standard for his work, and above all was kind and understanding with his patients—he was in every sense a good doctor. Kimbell left Brighton to become the first resident surgical officer at the newly built Kent and Sussex Hospital, and later held resident posts in London in preparation for his chosen specialty of obstetrics and gynaecology. In 1939 he was mobilized with the 10th C.C.S., a Territorial Army unit in which he was surgical specialist, and he was soon with the B.E.F. in France. The 10th C.C.S. was an early victim in the battle for France, and Kimbell was captured at Krombeke, near Dunkirk, on May 30, 1940. Then began the five long weary years as prisoner-of-war with the many changes and buffetings of fate. Camiers, Lille, Enghien, Malines, Dieburg, Kleinzimmern, Spangenberg, Rouen, Thorn, Rotenburg, Hildburghausen, to mention some of the stops, and finally at Obermassfeld, where he ended the war as senior British medical officer and was freed by the American Third Army. Kimbell was a good officer as well as a good doctor, and always defended the rights and interests of the patients and orderlies with the Germans, so much so that at one stage he was prevented from working and sent to an Oflag for punishment. But perhaps his greatest attribute while a prisoner-of-war was his morale, which was always high. He was an inspiration to others, and I am sure there must have been many in prison camps and prison hospitals who were for ever grateful to him. After the war he resumed practice in London, and in those hectic post-war years of readjustment worked day and night, almost as if obsessed, trying to make up for the lost years. Then in 1954 his health broke down, and he was forced to reduce his work and limit his activities, which caused him great sadness. Kimbell was first and foremost an idealist, and his great love was his work and his patients, but like all idealists he was bound to suffer disappointment, especially in this post-war world. He loved the tradition of England and the endless variety of London, yet retained an affection for Brighton, which he visited frequently; his greatest relaxation, especially in these latter years, was a dinner party which his wit and jollity could well make memorable.

Sir JOHN GOODWIN, K.C.B., K.C.M.G., D.S.O.

Hon.D.Sc., F.R.C.S., Hon.F.R.C.S.Ed.

The obituary of Sir John Goodwin was published in the *Journal* of October 22 (p. 1242).

We are indebted to Sir HENRY HOLLAND, C.I.E., for the following appreciation: In your notice of Sir John Goodwin's career and all he did, I felt that there was not enough attention given to the man as a sportsman and a very wonderful character. I knew him from the year 1905. We were in Quetta together, and he actually attended my wedding in 1910. He was, when I first met him, operative surgeon in the Quetta cantonment, and he used to come down to my hospital in order to get practice in types of major surgery which were not available to him in the military hospital. He had a remarkable career and rose to the top as Director of Medical Services at the age of 52.

Goodwin was recommended by his friend, Major-General O'Donnell, in France, to accompany the Balfour Mission to the U.S.A. as representative of the Army Medical Department. There he was mainly responsible for organizing the U.S.A. Army Medical Department, and wrote several valuable papers on the subject. Just before he left the

U.S.A. to return to Britain, he was approached by a publishing firm with a very tempting offer if he would sell his manuscripts on medical military organization. Goodwin replied, "Would you just mind waiting a few moments while I ring a friend?" He was back in a few minutes and said, "The papers are no more for sale. I have given them to the U.S.A. Medical Services." "And what sum did you get?" he was asked. Goodwin answered: "I handed them over as a gift. I did not come to the U.S.A. to make money but to help them to win the war."

After his return from the U.S.A., when Goodwin took over charge at the War Office, he found that there were several young unmarried doctors, under 35, who had not seen medical service overseas in any way. They were in medical charge of nursing-homes belonging to ladies of considerable private means and influence. Goodwin sent for his Assistant Director, and, although he realized that he was up against a stiff problem, yet he was determined to put an end to this wire-pulling to evade service. He accordingly told his deputy to produce a list of all doctors who had not been on military duty and who were under the age of 35 and unmarried. This was put before Goodwin the next day. He said, "These first 25 will go out on the first available troopship." His assistant replied, "There is one man that we will not be able to move. We have already tried several times." Goodwin said, "Put his name down." Within two hours of the War Office opening the next morning a lady of standing and wealth appeared and said, "General Goodwin, I hope you will make an exception in the case of this man, for he has been working with me and has done invaluable work—I cannot spare him." Goodwin replied, "He must take his place with the rest." The lady retorted, "He won't go!"—and banged the door. Within the course of the next two to three hours he got a telephone message from the Minister of War, saying that this man had been of great help to so-and-so, and he hoped that Goodwin would make an exception; but the reply was, "I am very sorry, I must keep to my decision and he will have to go." The next morning came a letter from Buckingham Palace from the King's private secretary. He hoped that Goodwin would allow the man to stay in the lady's nursing-home as she had done so much for the country. Goodwin then replied, "If I am to take this as an order from the King, then I must consider handing in my resignation to the War Council." His Majesty sent a reply that he wanted nothing further done. This was just one instance of nothing preventing him from doing what he thought was right.

On another occasion at the end of the war a case came up of a man who had lost an arm in Mesopotamia and had put in for a wound pension. The Adjutant-General pointed out that he had applied two days late and therefore his request could not be considered. Goodwin said that if they would not consider it, although he was not allowed to question this at that time, then as soon as the war was over he would give a full account of the case of this man and publish it in the daily press. They gave in.

Goodwin was a tremendous sportsman. He had two horses which he used to race in Quetta. He was also field master of the hunt, and I used to go out with him. He was also a very fine shot. He gave me a gun, I remember, and he was also quite a wizard as a fisherman.

Another glimpse of his character is demonstrated by his action at the time when a man in the R.A.M.C., who was a great friend of his but very junior, had been reported for being under the influence of drink while on duty. Goodwin sent for him and told him he was sacked; but he added, "After the war is over, if I can get a job for you I will do it." An example of his sense of humour can be given from the days when he used to come to the Mission Hospital at Quetta for surgery. I quite well remember on the first three occasions when he himself operated we had, as was usual, a short prayer before he operated, to which Goodwin made no comment. The next day I was going to operate myself, and I said, "I hope you don't mind, old man, if I do it. I promised the relations I would." Then I put up the same short prayer and saw a smile come over Goodwin's face. "What is it?" I said. "Oh, nothing," he replied, "only I am so relieved that you pray when you yourself operate. I thought it was only when poor devils like me from outside did the job that you said, 'God help them!'"

I have lost, in Jack Goodwin, one of my greatest friends: one could not have had better. I was able to visit him continually while he was in Marlborough until just before his death. He was one of my ideals, and it goes without saying that he was a man who would never let you down.

Medical Notes in Parliament

RATING OF SCIENTIFIC SOCIETIES

LORD ADRIAN'S FEARS

[FROM OUR PARLIAMENTARY CORRESPONDENT]

Lord ADRIAN took the opportunity of a debate on scientific policy in the House of Lords on November 9, when the Report of the Advisory Committee on Scientific Policy for 1959–60 came under review, to enter a strong plea for increased financial assistance for the scientific societies. He foresaw a danger that there might be a reduction in the help they got from the State because of an unexpected and unintentional reduction through a proposed change in the way they were rated. These independent scientific societies played an important part. Progress in pure and applied science was immensely helped by them, some encouraging particular branches and some science in general. They had been the main forum for the interchange of ideas. They had meetings and libraries—the Royal Society of Medicine, for example, had the best medical library on this side of the Atlantic—they published their own journals, and they became the representative bodies that awarded merit and could be called on for advice. Their direct value in bringing scientists together did not need emphasizing, and they had an even greater value in providing inceptives and guidance to young men.

State Assistance

These societies began, like most of the hospitals, supported entirely by voluntary contributions. But for more than 100 years they had been assisted by the State—by the provision of buildings, exemption from rates, and recently by grants for publications. It had been a thoroughly British arrangement. They had kept their freedom and independence, but the help from the State made it possible for them to shoulder the much greater responsibility they had to face nowadays when science grew overnight. The finances of none of them were very large. They spent what they had got, and some of them spent more. Exemption from rates had been given because the societies came within a special form of charity. The system of rating charities was full of inconsistencies, and in the process of trying to tidy it up the Pritchard Committee had proposed that the societies now exempt should pay half the full ratable value of their premises.

Effect of Increasing Rates

If the scientific societies had to shoulder this new burden without any increased help they must put up their subscriptions and cut down their expenses—that was to say, cutting down their journals and the meetings they arranged. No one would wish to see a reduction in the publications of these learned societies. If the change took place no doubt the large national societies would survive it, although they might be maimed. But some of the smaller societies, which looked after highly specialized branches of science, might be faced with extinction if the Pritchard recommendations were adopted and the State did not come to the rescue by putting up its grants—which would be paying out of the national pocket to balance the demands of local authorities for their revenue.

"It needs emphasizing," Lord Adrian said, "that we may find ourselves paying too high a price for a tidy system of rating. The price may be a really serious reduction in the great scientific asset we have in some of these independent societies. Some local authorities would gain financially, but we should all lose in the long run. In fact, the Government might well consider going a good deal further in the aid they give to this particular section of our scientific effort."

Travelling Expenses

He also made the point that communist countries spent a good deal in providing for congresses, the housing of meetings, and the journeys of scientists to visit one another, all of which had become an essential part of the modern way of advancing in science. A country which could offer facilities of this kind had a considerable pull over one which could rely only on private funds. British scientists, in organizing their meetings, had been greatly helped by industry and by research funds, as well as by private benefactions, and were not so badly placed. They still got many foreign scientists who came at their own expense or the expense of their own countries. But a country which would pay the travelling expenses of foreign scientists had a much better chance of learning what they were doing. It was sometimes rather embarrassing to find how little they had to offer to people whose visits were a real source of profit to science in Britain.

Lord Hailsham Asks for Details

Viscount HAILSHAM, Lord President of the Council and Minister for Science, acknowledged the force of all this, and explained that on the rating of the learned societies he was aware of the position only in general. He invited Lord Adrian to "memorialize" him or the Chancellor of the Exchequer on the exact position. It was under consideration by the Government, and he was not sure what the answer was.

DRUGS FOR PRIVATE PATIENTS

[FROM OUR PARLIAMENTARY CORRESPONDENT]

The Conservative back-benchers' motion on the subject of free drugs for private patients has been revived with the commencement of the new session. The one that lapsed with the prorogation had attracted 178 signatures. The new one, sponsored by the original group led by Mr. ANTHONY MARLOWE (Hove), attracted more than 70 within a few days of its appearance, and also an Opposition amendment. The motion asks the House to declare its opinion "that private patients should be entitled to obtain their medicines and drugs on the same terms and conditions as National Health Service patients," and urges the Government to introduce the necessary legislation without further delay. The amendment, tabled by Mr. ARTHUR LEWIS (West Ham, North), suggests instead that the Government should introduce legislation "for the abolition of all charges" on the Health Service.

When future business was discussed on November 10 Mr. M. LIPTON (Brixton, Lab.) drew attention to this motion, and asked Mr. R. A. BUTLER, as Leader of the House, if he would treat it "with the same skill and expertise that he showed in dealing with a similar motion last session." Mr. BUTLER replied enigmatically that he had studied the motion, and it was naturally under consideration by the Minister of Health.

£2m. to £3m. Involved

Sir MALCOLM STODDART-SCOTT (Ripon, Con.) asked the Minister of Health on November 14 what would be the estimated extra cost to the Health Service if drugs and dressings, which are now available free to British subjects and foreigners who attend doctors in the Health Service, were made available to all British subjects whether they attend a Health Service doctor or their own private practitioner. Mr. E. POWELL replied: On a rough estimate, the extra annual cost of providing drugs and dressings on Health Service terms for residents in Britain not now registered with a Health Service doctor might be between £2m. and £3m.

QUESTIONS IN THE COMMONS

Epilepsy in a Glider Pilot

Mr. B. JANNER (Leicester, North-west, Lab.) asked the Minister of Aviation on November 7 if his attention had been called to the case of a young gliding instructor at the London Gliding Club who was recently killed, with his pupil, at Dunstable Downs, at whose inquest it was revealed that he had for some years suffered from epilepsy; and whether he would inform such clubs that all instructors must pass a rigid health test before taking up such employment. Mr. GEOFFREY RIPPON, the Parliamentary Secretary, said that this tragic accident had been brought to his notice, and discussions on its implications were taking place with the British Gliding Association. There were, he added, no existing powers in respect of gliding clubs or individuals to impose health tests. That was one of the matters for discussion with the association.

Suicide Law Reform

Mr. KENNETH ROBINSON (St. Pancras North, Lab.) asked the Home Secretary on November 10 if it was his intention to introduce legislation during the present session to reform the law of suicide and attempted suicide. Mr. BUTLER: Yes, I hope to do so during this session.

Resettlement of Overseas Doctors

Mr. L. PAVITT (Willesden, West, Lab.) asked the Minister of Health on November 14 what consultations had taken place with the Colonial and Commonwealth Relations Offices to facilitate the acceptance by doctors of posts overseas and their subsequent reabsorption into medical service in the United Kingdom. Mr. POWELL stated that he was not aware of any special obstacle to the reabsorption into medical service here of doctors who had taken posts overseas; but he would be happy to consider any specific problem which Mr. Pavitt had in mind.

Medico-Legal

INQUEST: TALC PNEUMOCONIOSIS

A verdict of death from industrial disease was recently recorded in Birmingham on a man suffering from talc pneumoconiosis. The inquest was upon Arthur Griffiths, aged 64, who for some 41 years had worked for the Dunlop Rubber Company.

Dunlop's safety officer, Mr. W. J. Wellings, told the coroner that the deceased had worked in the cycle tube extruding department from 1925 to 1944, where there would have been a lot of dust. Dangerous commodities were avoided where possible. In the extruding department French chalk containing talc was still used because, so far as was known, nothing else would do the job. Steps were, however, taken to prevent this form of dust getting into the atmosphere. The factory departmental manager said that since 1944 the deceased would not have been in contact with any talc. In the extruding department the machines were housed in a section of a large building some 100 yards long, and when the deceased started his employment the job was a very dusty one; tubes were dusted externally with French chalk, and chalk was blown through with compressed air. Since 1940 the system had been modified to lessen the amount of chalk dust in the atmosphere. He thought the

firm had not been aware of the dangers of French chalk until an inquest on one of their employees in 1954. Since then they had been very conscious of the problem, which was a very difficult one; dust extractors and vacuum cleaners were used to clear the chalk, and damp sawdust was put down during sweeping. Talc was still blown through the tubes with compressed air; a certain amount of talc still escaped into the atmosphere of the extruding department and workmen's overalls became dusty.

Fourth Case in Birmingham

Dr. F. E. D. Griffiths, Home Office pathologist, said that in 1954 he had discovered the first case of talc pneumoconiosis in Birmingham; this was the fourth case since then. Each deceased had been employed at Dunlop's in the extruding department, and when the first case arose he had inspected the company's premises; in his opinion the atmosphere would not now be harmful. As he understood it there was no real substitute for French chalk in the industry. At necropsy he had found that the deceased's air passages contained thin mucopus. The pleural cavities showed dense apical adhesions, and recent adhesions over the lateral aspects of both lungs. The lungs showed considerable black pigmentation. There was apical bullous emphysema and at the right apex an area of healed fibro-caseous tuberculosis. The left apex showed an area of fibrosis and cavitation. The cavity was filled with greyish granular material. Throughout the lungs were nodular areas of fibrosis, and strands of fibrous thickening joined nodules together. The subcarinal glands showed fibrosis and calcification. The other hilar glands showed oedema and pigmentation. There was no evidence of silicosis or active tuberculosis. Both lower lobes showed broncho-pneumonia. In the right lower lobe the bronchopneumonic areas were confluent. He produced a quantity of talc (4.8 g.) from 25 g. of wet lung. In his opinion death was due to bronchopneumonia accelerated by talc pneumoconiosis. The pneumonia was a direct complication of the talc. A further terminal cause was peritonitis due to cystitis arising through the deceased's illness.

Universities and Colleges

UNIVERSITY OF EDINBURGH

At a meeting of the University Court held on October 24 honorary status was granted as follows: Dr. A. D. Bain, Honorary Senior Lecturer in the Department of Pathology; Dr. Margaret Methven, Honorary Senior Lecturer in the Department of Child Life and Health; Dr. J. A. D. Anderson and Dr. Hugh Miller, Honorary Lecturers in the Department of Public Health and Social Medicine; Dr. S. H. Davies, Honorary Lecturer, and Dr. B. M. Kennelly, Honorary Research Fellow, both in the Department of Medicine; Dr. G. N. Cooper, Honorary Lecturer in the Department of Bacteriology.

The following appointments were made: Dr. S. Simonian, Dr. D. W. Forster, and Dr. Andrew Gunn, Demonstrators in the Department of Anatomy; Dr. B. I. Davies, Lecturer in the Department of Bacteriology; Dr. C. M. Drillien, Lecturer in the Department of Child Life and Health; Dr. J. R. Sutherland, Lecturer, and Dr. D. C. Flenley, Assistant in the Department of Medicine; Dr. M. Jacobson, Lecturer in the Department of Physiology; Dr. W. E. S. Kiernan, Lecturer in the Department of Psychological Medicine; Dr. F. A. Boddy, Assistant, and Dr. R. J. Peters, temporary Lecturer in the Department of Public Health and Social Medicine.

The following terminated or will terminate their appointments on the dates indicated in parentheses: Dr. M. Wakefield, Lecturer in the Department of Child Life and Health (July 31, 1960); Dr. A. D. Bain, Lecturer in the Department of Pathology (September 30, 1960); Dr. K. M. Levy, Assistant in the Department of Public Health and Social Medicine (December 31, 1960); Mr. E. J. Delamore, Honorary Senior Lecturer in the Department of Surgical Science (September 30, 1960).

UNIVERSITY OF LONDON

Dr. D. R. Laurence, Senior Lecturer at University College and University College Hospital Medical School, has been appointed to the University Readership in Pharmacology and Therapeutics tenable at the College and School.

The title of Reader in Tropical Hygiene in the University of London has been conferred on Dr. B. B. Waddy, in respect of his post at the London School of Hygiene and Tropical Medicine.

Dr. S. Cohen, of the National Institute for Medical Research, has been appointed to the University Readership in Immunology, tenable at St. Mary's Hospital Medical School.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a Quarterly Comitia of the College held on October 27, with the President, Sir Robert Platt, Bt., in the chair, Dr. R. A. Hickling, Dr. Charles Newman, Dr. R. D. Curran, and Dr. J. F. Stokes were elected Councillors of the College.

Sir Harold Boldero was re-elected College representative on the Committee of Management. The appointments were confirmed of Dr. E. F. Scowen as College representative on the Drug Requirements Committee—Poisons Board, in place of Dr. C. A. Keele, who has resigned; of Professor A. Kekwick and Professor G. M. Wilson as College representatives on the Joint Formulary Committee; of Dr. H. L. Wilson as College representative on the National Association for Mental Health. The appointment of Dr. R. F. L. Logan as Milroy Lecturer for 1962 was announced. The subject of his lecture will be "The Quality of Medical Care."

The following candidates, having satisfied the Censors' Board, were elected Members of the College:

B. G. Adams, W. L. Ashton, J. S. Cameron, M. Ll. Clark, Captain G. C. Cook, R.A.M.C., Hilary J. Crawford, T. Crawford, G. M. Davies, J. Dupré, G. M. Edington, S. D. Elek, H. J. L. Francis, M. P. Joyston-Bechal, S. Kumari, M. J. S. Langman, A. L. Maresky, K. M. Mody, R. M. Norris, N. W. Oakley, D. O. Oliver, C. K. Ramachandran, Ellen L. M. Rhodes, J. F. Robinson, R. S. C. Scoular, L. Sinclair, A. D. M. Smith, P. Stephenson, D. J. Ward, P. S. W. Wilkins.

Licences to practise were conferred upon the following 107 candidates who have passed the final examination in Medicine, Surgery, and Midwifery of the Conjoint Board and who have complied with the by-laws of the College:

M. K. V. Adalja, R. O. Addae, A. Adeniyi, F. P. Adler, A. Andan, P. Anderson, A. F. J. Atkins, J. C. C. Ayling, Margaret L. Birtwistle, Shirley M. Blackman, I. H. Blair, W. J. Boerema, Shirley A. Bond, H. C. Booth, G. T. Bowra, A. J. Bron, Catherine M. L. Brown, H. M. Carpenter, T. I. Cash, M. E. Cavendish, Bernard Wan-Bun Chan, Hung Cheng, T. J. H. Clark, Pauline T. Combe, K. J. Connolly, Kathleen Curtis, R. S. Dawkins, M. J. Denham, I. S. Duff, Elizabeth A. Edwards, P. R. M. Ernst, P. R. Evans, P. R. H. Evison, Gillian Freeman, W. Galley, A. E. Gent, J. D. Gibling, D. Glatt, V. L. Gokhale, R. W. D. Gomes, C. D. Granger, D. G. Gwyn, G. Hamber, J. Hamilton-Paterson, Josephine E. Hammond, R. I. Harrison, Judith M. Hawker, J. B. Hicks, A. Himaya, J. Holmes, J. Hood, A. P. Hopkins, Joan N. Horton, D. P. M. Howells, G. V. Hughes, P. M. Humberstone, D. McA. Hunter, J. M. Ibrahim, E. G. Jackson, D. C. Jeffery, G. J. Johnson, M. T. Jones, P. N. Kersley, D. King, K. Kyei-Mensah, T. R. Lawson, Eveline B. McCulley, A. F. McGibbon, R. K. Mackenzie-Ross, I. C. McLellan, K. M. A. Madgwick, M. P. Madigan, J. R. Mansfield, P. H. Millard, N. D. Minton, J. Moore, Ursula V. L. Morris, P. B. Mudge, J. F. O. A. I. Mustaffah, Margaret A. Nunan, C. S. Ogg, N. N. V. O'Sullivan, D. J. Patel, P. B. Pattison, R. H. Pearce, E. P. Pereira, Mary Petrelli, E. Proctor, Jacqueline J. Rees, S. Sahai, Wendy D. Savage, Jean A. Skinner, C. J. Spivey, J. D. Swales, F. J. B. Taylor, W. Thompson, Sheila M. Thwaites, P. E. Walker, E. R. Walrond, L. M. Webber, M. MacK. Wicks, J. G. Woolich, J. S. C. Wright, F. W. Yates, F. M. Young, Ting Chiu Yu, W. W. Zabron.

Diplomas in Laryngology and Otology, in Child Health, in Ophthalmology, in Physical Medicine, in Tropical Medicine and Hygiene, in Industrial Health, in Medical Radiodiagnosis, and in Anaesthetics were granted, jointly with the Royal College of Surgeons of England, to the successful candidates whose names were printed in the report of the meeting of the Royal College of Surgeons of England in the *Journal* of October 29 (p. 1322). Diplomas in Psychological Medicine were similarly granted to T. F. Burke, J. B. Collinson, and A. McQuaid.

ROYAL AUSTRALASIAN COLLEGE OF PHYSICIANS

The following candidates, who were successful at an examination held in Australia, were admitted to Membership of the College on October 10:

Dr. J. S. Duke, Dr. M. T. Tavyatt, Dr. I. J. Mackie, Dr. F. L. Rothwell, and Dr. G. S. Walker, of New South Wales; Dr. J. K. Dawborn, Dr. J. E. Gault, and Dr. B. C. Ritchie, of Victoria; Dr. A. G. Collins, Dr. R. L. Hodge, Dr. D. A. Kennedy, and Dr. T. A. White, of South Australia; Dr. J. E. Edwards, Dr. John Ferguson, and Dr. E. D. O'Callaghan, of Queensland; and Dr. D. H. Gutteridge, of Western Australia.

ROYAL AUSTRALASIAN COLLEGE OF SURGEONS

A. J. Duke and H. G. Watts, having satisfied the Court of Examiners, were admitted to Fellowship of the College on October 20.

Vital Statistics

Food-poisoning from Raw Milk

Raw tuberculin-tested milk, unsterilized and unpasteurized, is believed to be the cause of an outbreak of food-poisoning in Leek, Staffordshire. Up to November 13 41 people had been found to be infected with *Salmonella typhimurium*. Three were sufficiently ill to be admitted to hospital: a child of 5 months, his sister aged 3½ years, and a woman aged 35. Many of the infections were subclinical. In all these cases milk from the suspected source had been consumed, and a bottle of this milk was subsequently found to contain *S. typhimurium*. Milk from this source has now been made safe for human consumption. Rectal swabs from 41 cows in the herd concerned were cultured: 39 were negative and 2 were positive for *S. typhimurium*. The Public Health Laboratory Service is undertaking phage-typing. For these particulars we are indebted to Dr. H. E. Wilson, acting medical officer of health of Leek.

Infectious Diseases

Areas where numbers of notifications were high in the latest two weeks for which figures are available

	Week Ending Oct. 29	Nov. 5
Dysentery		
Lancashire	53	**51**
Liverpool C.B.	14	**15**
Manchester C.B.	3	**15**
London	72	**56**
Lewisham	16	**10**
Southwark	2	**12**
Surrey	41	**24**
Epsom and Ewell M.B.	16	**10**
Yorkshire West Riding	101	**71**
Leeds C.B.	64	**39**
Glasgow	107	**101**
Measles		
Lancashire	1,433	**1,700**
Burnley C.B.	100	**142**
Liverpool C.B.	151	**259**
Manchester C.B.	108	**167**
Darwen M.B.	116	**102**
Leigh M.B.	148	**104**
Yorkshire West Riding	474	**550**
Bradford C.B.	101	**150**

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in September were 90, compared with 94 in the previous month and 156 in September, 1959.

The number of cases of industrial disease in the United Kingdom reported during September were as follows: lead poisoning 4, aniline poisoning 7, epitheliomatous ulceration 17, chrome ulceration 30, total 58. There were no deaths.—*Ministry of Labour Gazette*, October, 1960.

Anthrax Made Notifiable

Under the Public Health (Infectious Diseases) Amendment Regulations, 1960, medical practitioners are required, from December 1, to notify cases of anthrax to the medical officer of health of their district. This is additional to the requirement under the Factories Act, 1937, that cases of anthrax contracted in any factory must be notified to the Chief Inspector of Factories. That anthrax should also be notified to the medical officer of health was a recommendation of the Committee of Inquiry on Anthrax appointed by the Minister of Labour. This committee thought that the practical advantages of the notification of anthrax under the Public Health Act, 1936, would include an increased awareness among general practitioners of the possibility of cases of anthrax occurring; the help and guidance which the medical officer of health could give on where to send cases for a second opinion or for treatment; and the empowering of the medical officer of health to investigate the source of infection and to take any necessary action outside the scope of the Factories Acts.—Ministry of Health Circular 24/60.

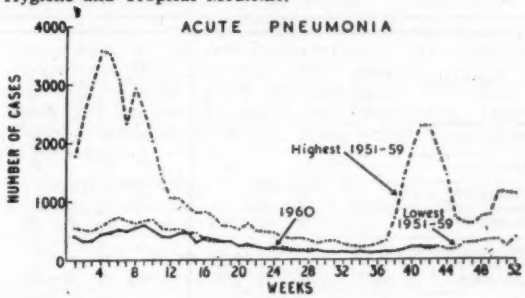
Poisonous Crayons

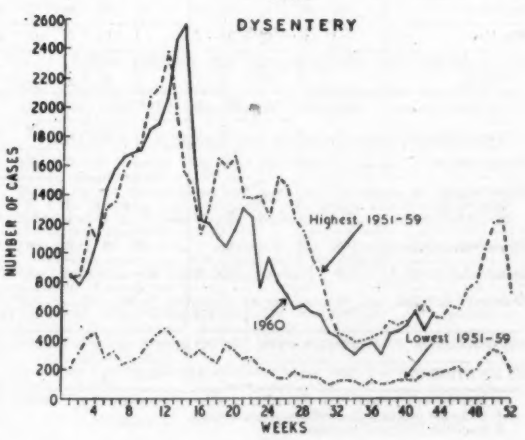
Poisonous materials were found in crayons and grease pencils made by one manufacturer who submitted a tender to the L.C.C., according to the Annual Report of the Scientific Adviser to the L.C.C. for 1959. Because children tend to suck or bite the ends, says the report, such materials should be free from poisonous pigments. In this particular sample orange and green colours were found which contained lead chromate; white, antimony oxide; and reds and greens, traces of soluble barium compounds.

The report draws attention to a hazard to young people which can arise from unsupervised private experiments in chemistry based on books that popularize the subject. "Several of such books (and possibly school prizes) were reviewed, and it was noted that there was some tendency to understate the dangers involved."

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1951–9 are shown thus ------, the figures for 1960 thus ———. Except for the curves showing notifications in 1960, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **October 29** (No. 43) and corresponding week 1959.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the whole of England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1960					1959				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	6	2	1	3	0	2
Dysentery ..	581	72	170	15	4	465	41	208	3	32
Encephalitis, acute	3	0		0		2	0		0	
Enteric fever:										
Typhoid ..	3	1	1	0		5	3	1	1	
Paratyphoid ..	7	0	0	0		6	3	0	0	2(B)
Food-poisoning ..	196	19	37	4		195	39	9	0	
Infective enteritis or diarrhoea under 2 years				14	41				30	38
Measles*	4,585	261	98	3	28	1,038	15	23	12	31
Meningococcal infection	18	0	5	0	1	13	0	11	1	1
Ophthalmia neonatorum	9	3	1	0		16	4	4	0	
Pneumonia† ..	221	24	122	4		207	11	128	3	
Poliomyelitis, acute:										
Paralytic ..	13	2	8	1	4	13	3	0	2	2
Non-paralytic ..	2	1				0	0	0		
Puerperal fever§ ..	171	31	10	2		203	26	10	0	
Scarlet fever ..	409	24	56	29	34	980	56	125	30	40
Tuberculosis:										
Respiratory ..	343	47	80	21		438	39	73	16	
Non-respiratory	57	7	15	1		54	6	9	6	
Whooping-cough	964	84	98	9	52	453	30	136	7	47

DEATHS	1960					1959				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	1	0		0		0	0		0	
Encephalitis, acute		0			0		1			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years		0	1	3	1	3	0	2	0	1
Influenza	20	0	1	0	0	16	1	0	0	0
Measles		0	0	0	0		0	0	0	0
Meningococcal infection		0	0				0	0		
Pneumonia ..	528	44	17	12	8	369	31	9	14	3
Poliomyelitis, acute	0	0		0	0	1	1		0	0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	69	8	5	1	3	49	3	3	0	1
Non-respiratory		1	0	0	0		1	2	0	0
Whooping-cough	0	0	0	0	0	0	0	0	0	0
Deaths 0–1 year .	321	31	30	10	10	265	26	30	7	17
Deaths (excluding stillbirths) ..	10,003	815	552	122	179	8,574	676	527	109	119
LIVE BIRTHS ..	14,458	1235	944	271	308	13,251	1098	957	234	358
STILLBIRTHS ..	286	16	21			240	18	26		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

Royal Society's Royal Medal

Sir ROY CAMERON, F.R.S., professor of morbid anatomy, University College Hospital Medical School, since 1937, has been awarded the Royal Society's Royal Medal for his distinguished contributions in the field of cellular pathology.

Sir Roy, who was born in Victoria, Australia, in 1899, was educated at Kyneton High School, and at the Universities of Melbourne and Freiburg im Breisgau. He was first scholar and then tutor at Melbourne from 1916 to 1928. In 1926 he replaced F. M. BURNET (now knighted) as assistant director of the Walter and Eliza Hall Institute, and stayed there till 1928, when he was granted a B.M.A. scholarship to carry out research under LUDWIG ASCHOFF at Freiburg. In 1930 he went to U.C.H. Medical School and from 1934 to 1937 was reader in anatomy there. He was made an F.R.S. in 1946 and knighted in 1957. He was assistant editor of the *Journal of Pathology and Bacteriology* for 20 years, and has been a member of the Agricultural Research Council and the Medical Research Council. He has been secretary of the Advisory Council, Beit Memorial Fellowship for Medical Research, since 1959. He published *Pathology of the Cell* in 1952, *New Pathways in Cellular Pathology* in 1956, and has written numerous papers, many of them dealing with his particular interest, the liver.

[Walter Stoneman

Wellcome Wing of Clinical Research, Birmingham

The Wellcome Wing of the Clinical Research Laboratories, to which the Wellcome Trust has contributed £95,000, was opened on November 15 by Sir HENRY DALE, O.M., F.R.S. A photograph and description of the new wing, which provides accommodation for the departments of medicine and surgery, appeared in the *Journal*, May 14, on p. 1516.

Directories of Micro-organisms

The Permanent Committee, British Commonwealth Collections of Micro-organisms, has issued revised editions of the *Directories of Collections and Lists of Species* maintained in the United Kingdom, Ghana, and Trinidad (12s. 6d.), Australia (8s.), New Zealand (3s.), Canada (9s.), India (6s.). These are obtainable from H.M.S.O. at the net prices indicated in parentheses. Information about collections not listed in these directories, or additional information about those that are listed, should be sent to the Secretary, U.K. National Committee of the British Commonwealth Collections of Micro-organisms, at the National Collection of Type Cultures, Colindale Avenue, London N.W.9.

Heinz Fellowships of British Paediatric Association

The following awards have been made for 1961:

Fellowship A: Dr. H. B. WONG (paediatric unit, General Hospital, Singapore) and Dr. G. H. HOLMAN (department of paediatrics, University Hospital, Saskatoon, Canada), to enable them each to spend eight weeks in the United Kingdom visiting paediatric centres and attending the British Paediatric Association's annual meeting. *Fellowship B:* Dr. C. A. REINDORF (haematology department, Hospital for Sick Children, Toronto, Canada), to enable him to spend nine months studying at paediatric centres in the United Kingdom and then three months in the University College of the West Indies.

Fellows of the B.M.A.

Sir ARTHUR PORRITT, P.R.C.S., President of the British Medical Association, presented certificates of Fellowship of the Association to two members of the Hampstead Division, Mr. SIDNEY BOYD and Dr. LINDSEY BATTEN, at a small ceremony in Hampstead on November 12. The presentation was in recognition of their devoted years of service to the profession and the Association, and was made in the presence of local practitioners and members of the executive and past officers of the Hampstead Division.

"British Medical Students' Journal"

An essay in the autumn number of the *B.M.S.J.* dealing with the rival claims on a medical student's spare time of the playing-field and the library is reflected in the cover picture—a pair of scales held in even balance by a rugby football and a row of books. As from the spring issue next year the present payment system of £2 2s. a page will be abolished and three prizes of £5 5s. each will be paid yearly for the best article in the following categories: (1) prose articles, (2) clinical articles, (3) other contributions (poetry, cartoons, photographs, etc.). Contributions for the next issue should reach the editor by December 15. (Price, B.M.S.A. members 6d., non-members 1s., from *B.M.S.J.*, B.M.A. House, Tavistock Square, London W.C.1.)

Dr. Livingstone's Baobab Tree

Dr. Livingstone's initials, carved inside a hollow baobab tree on the banks of the Zambesi in Portuguese East Africa, were discovered two years ago by the explorer, Mr. QUENTIN KEYNES, son of Sir GEOFFREY KEYNES, during an expedition which set out to retrace Livingstone's travels during his six-year Zambesi expedition from 1868 to 1874. Mr. Keynes recently made a second journey to the district to measure the tree, which Livingstone described in his diary, and to make a permanent record of the initials. The cast of the initials which he obtained is reproduced here and is to be presented to the Livingstone Museum at Blantyre in Scotland. The Portuguese authorities have declared the tree a national monument (see *Journal*, July 2, p. 82).

Association of Clinical Biochemists

The Association of Clinical Biochemists has elected the following officers for 1960–1:

President, Dr. C. P. STEWART; *chairman*, Dr. A. L. LATNER; *honorary treasurer*, Dr. R. GADDIE; *honorary editor*, Mr. H. VARLEY; *honorary secretary*, Dr. J. H. WILKINSON, Westminster Medical School, Horseferry Road, London S.W.1.

Change of Title

The *Journal of the Midland Mental Deficiency Society* has changed its title to the *Journal of Mental Subnormality*.

People in the News

Professor A. MONCRIEFF and Dr. J. D. W. PEARCE were members of the Advisory Council on the Treatment of Offenders which recently reported on corporal punishment.

The Blair-Bell Medal of the Royal Society of Medicine, awarded to Professor F. J. BROWNE, of Sydney, Australia, was recently received on his behalf by his son, Professor MCCLURE BROWNE. A tape-recording and photographs of the ceremony at the R.S.M. are being forwarded to Australia.

Dr. STEPHEN KRAUSS (Fair Mile Hospital, Wallingford) has been invited to deliver an oration on "Social Pathology and Psychiatric Humanism" at the Psychiatric University Hospital of the Charité, Berlin, on the occasion of the Charité's 250th anniversary celebrations.

Dr. G. R. SHARP has been appointed to a research fellowship under a grant provided by Imperial Chemical Industries, Ltd., for research on respiratory physiology and anaesthesia in the department of surgery at the Western Infirmary, Glasgow. He will be concerned principally with the recently installed oxygen pressure chamber.

In Brief

California's Motor Pollution Control Bill requires that in future motor vehicles registered in California will have to carry devices to prevent car exhausts emitting specified pollutants.

COMING EVENTS

7th James Mackenzie Lecture, College of General Practitioners.—Dr. LINDSEY W. BATTEN, "The Medical Adviser." November 19, 11.30 a.m., the Great Hall, B.M.A. House, Tavistock Square, London W.C.1. Visitors welcome.

Royal College of Surgeons, Edinburgh.—Dr. KRISTIAN KRISTIANSEN (neurosurgeon, Oslo), "Selective Cooling of Organs with Special Reference to the Brain," November 22, 5 p.m., in Hall of College.

"Replacements for Life," B.B.C. T.V.—November 22, 9.15 p.m.: programme dealing with heart pacemakers, and with plastic arteries, heart valves, and eye lenses; December 20, 9.15 p.m.: Professor P. B. MEDAWAR, F.R.S., will discuss transplantation of living organs and tissues, and immune reactions.

Royal Free Hospital Lecture.—Dr. M. M. SUZMAN, Johannesburg, "Long-term Use of Anticoagulants," November 23, 5.15 p.m., at the Hospital, Gray's Inn Road, London W.C.1.

Charing Cross Hospital Medical School.—Inaugural lecture in surgery by Professor A. J. HARDING RAINS, "A Chapter of Accidents," November 24, 5.30 p.m., Royal Commonwealth Society, Craven Street, London W.C.2.

British Tuberculosis Association, British Association of Allergists.—Joint meeting. "Hypersensitivity Reactions to Anti-tuberculous Drugs," November 25, 5 p.m., Manson House, 26 Portland Place, London W.1.

FitzPatrick Lectures, Royal College of Physicians.—Dr. K. D. KEELE, "Evolution of Clinical Methods in Medicine": (1) November 29, "The Origins of Clinical Examinations"; (2) December 1, "The Quest for Significant Physical Signs." For details see advertisement p. 66.

Kettle Memorial Lecture.—Professor R. W. SCARFF, "Proliferative Lesions of the Breast," December 1, 5 p.m., Wright-Fleming Institute, St. Mary's Hospital Medical School, London W.2.

Cambridge University Medical School.—Symposia for anaesthetists during 1960–1: December 3, "Disorders and Treatments which Alter the Actions of Drugs used by the Anaesthetist"; March 18, "The Adrenal and Anaesthesia"; May 27, "Tracheostomy and Artificial Respiration." Details from Secretary of Medical School, Tennis Court Road, Cambridge.

Family Planning Association.—Training course for medical practitioners in London in January. For details see advertisement p. 67.

University of Sheffield.—Course in dermatology for general practitioners, March 20–24. Details in advertisement p. 67.

NEW ISSUES OF SPECIALIST JOURNALS

The journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London W.C.1.

BRITISH JOURNAL OF INDUSTRIAL MEDICINE

The Relation Between Lung Dust and Lung Pathology in Pneumoconiosis. G. Nagelschmidt.
Diffuse Pleural Mesothelioma and Asbestos Exposure in the North Western Cape Province. J. C. Wagner, C. A. Sleggs, and Paul Marchand.
Dust Diseases in Dundee Textile Workers. A. Mair, D. H. Smith, W. A. Wilson, and W. Lockhart.
The Study of Observer Variation in the Radiological Classification of Pneumoconiosis. J. W. J. Fay and J. R. Ashford.
The Classification of Chest Radiographs for Coalworkers' Pneumoconiosis. J. R. Ashford.
The Relationship of Byssinosis to the Bacteria and Fungi in the Air of Textile Mills. Peter Tuffnell.
Experimental Byssinosis. Peter Tuffnell.
Sickness Absence Among Forestry Workers in the North of Scotland, 1958. Donald McGregor.
Ecological Factors Affecting Efficiency and Health in Warships. F. P. Ellis.
Book Reviews.
Index.

Volume 17, No. 4. (Quarterly; £3 annually.)

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, November 21

HUNTERIAN SOCIETY.—At Apothecaries' Hall, London E.C., 8.30 p.m., Discussion: That Advertising does more Harm than Good. For the motion, Canon C. E. Raven and Mr. Reginald Murley; against, Mr. T. L. Marks and Dr. Fred Wrigley.

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., special university lecture in pathology by Professor C. E. Lumsden: Pathology and Pathogenesis of Multiple Sclerosis.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. Brian Ackner: Hysteria.

ST. ANDREW'S UNIVERSITY.—At Demonstration Room, Department of Medicine, 4 p.m., Dr. J. A. R. Lenman: Physiological Basis of Consciousness

Tuesday, November 22

BIRMINGHAM AND MIDLAND MEDICAL ART SOCIETY.—At Committee Room, Local Medical Committee, 36 Harborne Road, Edgbaston, 8 p.m., Mr. B. N. Brooke: Intention of the Artist.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. D. A. G. Galton: Contributions of Chemotherapy to the Study of Leukaemia.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. C. D. Calnan: Effects of Chemical Agents. Primary Irritants and Sensitizers.

LEEDS NEUROLOGICAL SCIENCES COLLOQUIUM, 1960.—At Littlewood Hall, General Infirmary at Leeds, 5.15 p.m., Mr. J. Hankinson: Surgical Treatment of Parkinsonism.

MANCHESTER MEDICAL SOCIETY.—At Large Anatomy Theatre, Manchester University Medical School, 4 for 4.30 p.m., University Lecture on the History of Medicine by Mr. A. R. Anscombe: Deaths of Three American Presidents.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Professor A. G. R. Lowdon: Treatment of Acute Vascular Insufficiency in the Limbs.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Lecture Theatre, Wright-Fleming Institute, 5 p.m., Professor Frank Goldby: Relation of the Nervous System to the Female Pelvic Organs.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. G. Parsons-Smith: Neurology.

Wednesday, November 23

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Haemopoietic System in Skin Diseases.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. T. Holmes Sellors: Diaphragmatic Hernia

INSTITUTE OF UROLOGY.—4 30 for 5 p.m., Mr. D. I. Williams: Anomalies of Development.

●LEEDS UNIVERSITY.—At General Infirmary at Leeds, (1) 5 p.m., Sir Andrew Claye: Forceps To-day. (2) 6 p.m., Miss Ursula M. Lister: Biochemical Changes in Pregnancy.

●NEW HEALTH SOCIETY.—At Ivanhoe Hotel, Bloomsbury Street, London W.C., 5.30 p.m., Dr. D. J. Gordon-Smith: Pros and Cons of Vegetarianism.

OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Professor J. T. Ingram: Clinical Significance of the Minute Vessels of the Skin.

PLYMOUTH MEDICAL SOCIETY.—At Duke of Cornwall Hotel, annual dinner and dance.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. V. Wynn: Acid-base Metabolism.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. H. Gough-Thomas: Research in the School Health Service.

ST. ANDREWS UNIVERSITY.—At Demonstration Room, Department of Medicine, 2.30 p.m., Dr. I. R. C. Batchelor: Recent Advances in Psychiatry (I).

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Nurses' Hall, West London Hospital, 8.30 p.m. Discussion: Recent Advances in Treatment. Speakers, Professor A. J. H. Rains (Surgery), Dr. Hugh Jolly (Paediatrics), Miss Helen Mayer (Gynaecology).

Thursday, November 24

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. H. B. Hewitt: Fundamental Aspects of the Radiotherapy of Cancer.

CHADWICK TRUST.—At Royal Society of Health, 90 Buckingham Palace Road, London S.W., 5 p.m., Malcolm Morris Memorial Lecture by Dr. R. Scott Russell: Radioactivity in Human Diet.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.—At Royal Commonwealth Society (Craven Street entrance), London W.C., 5.30 p.m., inaugural lecture in surgery by Professor A. J. Harding Rains: A Chapter of Accidents

HONYMAN GILLESPIE LECTURES.—At Anatomy Theatre, University New Buildings, Teviot Place, Edinburgh, 5 p.m., Sir Stanford Cade: Synovial Sarcoma.

ILFORD MEDICAL SOCIETY.—At Park Lane Hotel, annual dinner and dance.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. C. D. Calnan: Cutaneous Allergy (I).

INSTITUTE OF LARYNGOLOGY AND OTOLOGY.—5.30 p.m., Dr. E. H. Mercer: Fine Structure of the Normal and Malignant Cell.

LIVERPOOL MEDICAL INSTITUTION.—Afternoon clinical meeting at Walton Hospital.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.15 p.m., Dr. M. Pai: Role of Hypnosis in Treatment, and short film.

LONDON UNIVERSITY.—At Wye College, Withersdane Hall, 8 p.m., Professor B. Maegraith: Effects of Disease and Environment on Economic and Social Development in Hot Countries.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor J. F. Nunn: Distribution of Inspired Gas During Thoracic Surgery.

ST. ANDREWS UNIVERSITY.—At Physiology Department Lecture Theatre, Queen's College, Dundee, 5 p.m., Professor J. L. Malcolm: Pharmacological Dissection of the Central Nervous System.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. Denis Williams: postgraduate demonstration in neurology.

Friday, November 25

BRISTOL UNIVERSITY: DEPARTMENT OF PSYCHIATRY.—At Geology Lecture Theatre, 8.30 p.m., Dr. J. B. Brierly: Clinico-pathological Aspects of Senile Dementia and Alzheimer's Disease.

BRITISH TUBERCULOSIS ASSOCIATION AND BRITISH ASSOCIATION OF ALLERGISTS.—At 26 Portland Place, London W., 5 p.m., subject: Hypersensitivity Reactions to Antituberculous Drugs. Papers by Dr. J. Everall, Dr. J. Morrison Smith, Dr. S. Z. Kalinowski, and Dr. N. W. Horne.

CAMBRIDGE MEDICAL SOCIETY.—At Owen Webb House, 1 Gresham Road, Cambridge, 8.30 p.m. Films: Investigation of Female Sterility; Dynamics of Alcoholism.

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. F. R. Bettley: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. Smart.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY.—4.30 p.m., annual address by Mr. F. McGuckin: Some Thoughts on the Actiology of Chronic Otitis Media.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 10 a.m., Mr. Ian Fraser: Some Problems in Paediatric Surgery. (2) 4 p.m., Professor A. Querido (Leyden): Goitrous Hypothyroidism. (3) 5.30 p.m., Professor W. W. Mushin: Controlled Respiration.

ST. ANDREWS UNIVERSITY.—At Demonstration Room, Department of Medicine, 4 p.m., Dr. I. R. C. Batchelor: Recent Advances in Psychiatry (II).

Saturday, November 26

BRITISH ASSOCIATION IN FORENSIC MEDICINE.—At St. George's Hospital, London S.W., 10.30 a.m., morning symposium: Patterns of Injury.

Sunday, November 27

MANCHESTER UNIVERSITY: FACULTY OF MEDICINE.—At Theatre 1, Clinical Sciences Building, York Place, Manchester, 11 a.m., in conjunction with North-west England Faculty, College of General Practitioners. Dr. Howard Kitching: The Mental Health Act.

APPOINTMENTS

BIRMINGHAM REGIONAL HOSPITAL BOARD.—T. Galla, M.B., Ch.B., D.P.M., Whole-time Consultant and Deputy Medical Superintendent, St. Edward's Hospital, Cheddleton, and to Stoke-on-Trent Group of Hospitals; J. H. Ross, M.D., M.R.C.P., D.Obst.R.C.O.G., Part-time Consultant Physician to Herefordshire Group of Hospitals; H. P. Robb, M.B., Ch.B., D.P.M., Whole-time Consultant Psychiatrist and Deputy Medical Superintendent to Lea Hospital and Lea Castle Hospital; Eileen E. Hill, M.D., M.R.C.P., D.C.H., Whole-time Consultant Paediatrician, and R. H. Sage, M.B., Ch.B., F.R.C.S., Whole-time Consultant Surgeon to Birmingham (Selly Oak) Group of Hospitals; R. L. Batten, F.R.C.S., Whole-time Consultant Surgeon to West Bromwich Group of Hospitals.

NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—J. H. Baylis, M.B., B.S., M.R.C.P., Assistant Physician (Consultant grade), Bedford General Hospital and Chest Clinic; Betty R. Warltier, M.B., B.Chir., F.F.A. R.C.S., D.Obst.R.C.O.G., Consultant Anaesthetist, Mount Vernon Hospital; A. I. Suchett-Kaye, M.D., M.R.C.P., Consultant Physician for Geriatric Service, Paddington General, St. Charles', National Temperance, and St. Columba's Hospitals; W. Braude, M.B., B.Ch., F.F.A. R.C.S., and V. J. Keating, M.B., B.Ch., F.F.A. R.C.S., Consultant Anaesthetists, St. Charles' Hospital; C. I. Finn, M.B., B.S., D.P.M., Assistant Psychiatrist (S.H.M.O. grade), Leavesden Hospital.

TAYLOR, WILLIAM, Ph.D., M.B., Ch.B., B.Sc., Industrial Medical Officer, Jute Industries, Ltd., and Honorary Lecturer in Industrial Health in the Department of Public Health and Social Medicine at Queen's College, University of St. Andrews.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Lynn.—On October 29, 1960, at Lewisham Hospital, London S.E., to Constance, wife of Dr. C. R. Lynn, a son—Jeremy David.

DEATHS

Arnell.—On October 25, 1960, at Kilifi, Kenya, Harrie Marguerite Arnell (formerly Hood-Barrs), M.B., B.S., of the Hill Farm, P.O. Box 571, Kitale, Kenya.

Clough.—On November 1, 1960, at Redcroft, Sarisdown Road, Exmouth, Devon, James Arthur Clough, M.B., late of West Africa, aged 88.

Craig.—On November 6, 1960, in Westminster Hospital, London S.W., Theodore Craig, M.B., Ch.B., of 35 Marsham Court, London S.W., aged 76.

Dimond.—On November 5, 1960, at his home, Cooldaniel, Greystones, Co. Wicklow, William Elliot Randall Dimond, C.I.E., C.B.E., L.R.C.P.&S.I. & L.M., D.P.H., Major-General, I.M.S., retired, aged 67.

Dowling.—On October 31, 1960, at 25 Kingsgate Castle, Broadstairs, Kent, Stanislaus Marcus Dowling, M.R.C.S., L.R.C.P., late of Rosbrae, Woodford Green, Essex, aged 94.

Faber.—On November 8, 1960, at 25 Chichele Road, Cricklewood, London N.W., Hamilton Stanley Faber, M.D., aged 82.

Kimbell.—On October 26, 1960, at his home, Claude Wilfred Alfred Kimbell, T.D., M.B., F.R.C.S.Ed., F.R.C.O.G., aged 55.

Leonard.—On October 21, 1960, at Camerton Thorngumbald, East Yorkshire, William Hugh Leonard, C.B., F.R.C.S., Colonel I.M.S., retired, aged 84.

McKinney.—On November 3, 1960, at his home, 33 Granville Road, Boscombe, Bournemouth, Hants, Patrick Peter McKinney, M.B., B.Ch.

McLaren.—On October 20, 1960, at 66 Bouverie Avenue, Salisbury, Elizabeth Lucy Colby McLaren, M.B., Ch.B., aged 86.

Mitchell.—On October 29, 1960, in Bolingbroke Hospital, London S.W., Robert Allen Mitchell, M.B., Ch.B., late of 2 Earlsfield Road, Wandsworth Common, London S.W., aged 55.

Newman.—On October 24, 1960, at Woking, Surrey, Herbert Robert Cambridge Newman, M.B., M.R.C.S., late of Bristol, aged 89.

O'Grady.—On October 31, 1960, at Bramnel House, 72 Upper Park Road, Broughton Park, Salford, Lancs, Terence Patrick O'Grady, M.B., B.Ch., D.P.H., aged 46.

Taylor.—On September 22, 1960, in Scotland, James Taylor, O.B.E., M.B., Ch.B., D.P.H., D.T.M.&H., of Larkspur Terrace, Jesmond, Newcastle upon Tyne, Northumberland, late of the Seycheiles and Fiji.

Watt.—On October 28, 1960, in Johannesburg, South Africa, the result of an accident, Andrew Campbell Watt, M.B., Ch.B.

Williams.—On November 1, 1960, Idris Williams, M.B., Ch.B., at "Ardrem," 2 Hill View, Henleaze, Bristol.

Any Questions

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Oral Contraceptives and Ovarian Function

Q.—*When pregnancy is strongly contraindicated on medical grounds, should oral contraceptive therapy be supported by barrier contraceptives? If oral contraceptive tablets are taken over a long period of time, is there any danger that the ovaries may atrophy or cease to ovulate?*

A.—The published evidence indicates that the use of norethynodrel plus ethinyloestradiol 3-methyl-ether ("enavid") for oral contraception provides a substantially higher degree of protection than does any other method on which there are published data. It seems improbable that the concomitant use of a mechanical barrier would add anything further. However, if the medical grounds for contraception are as strong as is suggested sterilization might well be the method of choice.

The longest time over which any patients have taken these tablets is no more than four years, so that it is not yet possible to state with certainty what the effects of very long-term usage will be. However, when the oral contraceptive has been given up after use for many cycles (e.g., 30 or more) there has been no reported case in which ovulation has failed to occur, while ovarian biopsies in such circumstances have shown no greater degree of follicle atresia than would be expected for the patient's age.

School Medical Examination

Q.—*Can the parents of children attending schools maintained by local authorities be compelled to have their children medically examined?*

A.—Yes, they can be compelled. Section 48 of the Education Act, 1944, imposes the duty on every local education authority to provide for the medical inspection, at appropriate intervals, of pupils in attendance at any school or county college maintained by them. For this purpose any officer of the local education authority so authorized by the authority can require the parents of any pupil attending such a school to submit the pupil for medical inspection. Failure to do so without reasonable excuse renders the parent liable to a fine not exceeding £5.

Oral Diuretics and Premenstrual Oedema

Q.—*I find that 1 or 2 tablets of an oral diuretic given twice or thrice weekly (plus salt restriction) during the 14 days before a period is due most helpful in preventing premenstrual oedema. Is this a sound treatment? Is there any known hazard to a foetus in the first 14–21 days after conception from chlorothiazide or other oral diuretics in the above dosage? Their use for premenstrual oedema obviously might be coincidental with an early pregnancy.*

A.—If restriction of salt and fluid alone fails to control troublesome premenstrual oedema, the administration of diuretics is an appropriate treatment. Acetazolamide and benzothiadiazine derivatives such as chlorothiazide have been widely used for this purpose in recent years. It is not usually necessary to give drugs over such a long period as 14 days. The unpleasant symptoms of the fluid retention are generally limited to a few days and there is no need to administer the chosen diuretic for longer than this. Limitation of the period of administration also minimizes the risk of seriously disturbing the electrolyte balance.

There does not appear to be any evidence that moderate doses of the diuretics at present available carry any real threat to an early conception, but it is a theoretical possibility. Acetazolamide acts as a diuretic by virtue of its carbonic-anhydrase-inhibiting properties, and the benzothiadiazine derivatives also exert a lesser but similar effect. The progestational alteration in *p*H of the endometrium, on which the implantation of the fertilized ovum depends, has been shown in the rabbit to be due to the action of carbonic anhydrase. This appears in increasing amounts as a result of a progesterone influence.[1] If the carbonic anhydrase is inhibited, implantation is likely to be disturbed or made impossible. It is unlikely that the diuretics in present-day use could have a significant effect of this kind, but if a more powerful carbonic-anhydrase-inhibiting drug were to become available the danger would be real. Indeed, such a preparation, especially if it had a selective action on the endometrium, might prove to be an efficient oral contraceptive.

REFERENCE

[1] Böving, B. G., *Ann. N.Y. Acad. Sci.*, 1959, **80**, 21.

Arthrogryposis Multiplex Congenita

Q.—*A third child was born with arthrogryposis multiplex congenita. The mother was exposed to rubella in the 10th week of pregnancy and was given gamma-globulin. So far as could be seen she did not develop rubella, but one of her children did. The affected infant is now 10 months old and has no other physical or mental defect. Is the association of arthrogryposis multiplex with rubella a purely chance occurrence in this case? Is there any hereditary or familial factor in this condition such as might recur in future pregnancies?*

A.—The association of arthrogryposis with exposure to rubella in pregnancy is very probably coincidental. The risk of a second child being affected with arthrogryposis is small. There have been no systematic genetic studies of the condition, but two authors[1 2] who have reviewed series of patients with the disorder found no relatives affected, while a third author,[3] who has included relatively mild cases, found three patients with a parent affected but only a single pair of sibs affected.

REFERENCES

[1] Mackenzie, D. Y., *Proc. roy. Soc. Med.*, 1959, **52**, 1101.
[2] Mend. N. G., Lithgow, W. C., and Sweeny, H. J., *J. Bone Jt Surg.*, 1958, **40A**, 1285.
[3] Kite, J. H., *Sth. med. J.*, 1955, **48**, 1141.

Treatment for Obsessional Neurosis

Q.—*What is the modern treatment for obsessional neurosis in a man aged 44?*

A.—Obsessional neurosis is not a clear-cut entity, and so there is no specific treatment. Obsessional symptoms are an exaggeration of qualities commonly found in healthy individuals such as rigidity in outlook, conscientiousness, tidiness, and cleanliness. An over-emphasis of these qualities is due to an unconscious drive or compulsion which may sweep aside common sense and conscious intentions. Obsessional symptoms may appear during the depressive phase of a cyclothymic (mild manic-depressive) disability. If the patient has had a similar experience during a previous depression, the first step is to treat the depressive element. Broken sleep should be corrected, and if there is early-morning insomnia, when suicidal thoughts are commonest, a quick-acting barbiturate (e.g., pentobarbitone sodium 100 mg.) should be taken on waking. Often the obsessional symptoms subside when the depression clears up. One of the anti-depressant drugs ("nardil," "stelazine," "tofranil," "melleril," or "marsilid") should be tried. Good results have been obtained with a mixture of nardil and stelazine or nardil and melleril. Marsilid has proved useful when phobic symptoms are prominent. Each of these drugs has its advocates. E.C.T. may be required when the depression is severe and should not be deferred. It can be given in addition to anti-depressant remedies.

Prefrontal leucotomy may be considered in a long-standing obsessional neurosis when the symptoms are crippling. Patients must be of sound personality, and careful selection

is important.[1] The early popularity of this operation has faded, and it should be undertaken only after full investigation and when other remedies have failed.

Psychotherapy may be combined with any physical method or used alone. As a rule obsessional patients are intelligent, but they can be extremely obstinate; they plead for help, but resist treatment to an astonishing extent. This is part of the disorder, and does not imply an overdose of original sin. Hypnosis is almost useless, and analysis of the passive type is disappointing. Provided the co-operation of the patient can be gained, relief may be obtained if the analyst is prepared to take an active part in the analysis, and in particular to give attention to the "time factor" in the symptomatology[2]: the fear of the future; the urge to make time stand still; and in the background the fear of death.

So far as age is considered, a man aged 44 would be acceptable for any form of treatment.

REFERENCES

1 Sargant, W., and Slater, E., *Physical Methods of Treatment in Psychiatry*, 3rd ed., 1954. E. and S. Livingstone, Edinburgh and London.
2 Bennet, E. A., and Shorvon, H. J., *Proc. roy. Soc. Med.*, 1957, **50**, 211.

Inheritance of Deaf-mutism

Q.—*What risk of having children affected with deaf-mutism is likely in one of my patients who has a mother, uncle, and aunt who are congenitally deaf and dumb, and whose mother had a stillborn child with spina bifida. The patient's husband is not a blood relative.*

A.—There is little risk of this patient having a child with deaf-mutism or with spina bifida. The majority of children with deaf mutism are homozygous for one or other of a small series of recessive genes.[1 2] The probability that this is the case in this family is increased by the fact that the parents of the affected individuals were second or third cousins. Accordingly, your patient is probably heterozygous for one of these genes, but cannot have a deaf child unless her spouse (who is not a blood relative) is also heterozygous for the same gene.

The risk of a child being affected with spina bifida is also small. The genetic mechanisms predisposing to spina bifida are not clearly understood, but empirically it is known that the risk of a nephew or niece of an affected individual also being affected is of the order of only about 1%.

REFERENCES

1 Stevenson, A. C., and Cheeseman, E. A., *Ann. hum. Genet.*, 1956, **20**, 177.
2 Chung, C. S., Robison, O. W., and Morton, N. E., ibid., 1959, **23**, 357.

Transporting Cripples Up Stairs

Q.—*My wife has recently had an operation for arthrodesis of the right hip. Is there any contrivance which runs on rails, or which can be propelled by hand or by some other means, for transporting her up and down a short staircase?*

A.—Anybody with a disability which makes stairs impracticable should carry out alterations to enable them to live on the ground floor, or alternatively move into bungalow accommodation. Lifts and chair escalators are available but cost about £500, and it is usually impossible to get escalators to negotiate corners. Also, as with any electrical appliance, there is always the risk of power failure. Professor E. A. Pask and Mr. N. Burn recently described[1] an experimental pneumatic lift made by them which would elevate a person from the ground to the first floor of a house. It consisted of a cage resting on bellows which, when blown up, raised the cage. The apparatus has not yet been produced on a commercial basis, but the authors think it could be and that it might provide a one-patient lift in most homes for £150 to £200.

REFERENCE

1 Pask, E. A., and Burn, N., *Brit. med. J.*, 1960, **2**, 939.

Ultrasonically Treated Milk

Q.—*It is said that exposure to ultrasonic waves conserves the composition and qualities of milk for a long time, even when exposed to tropical conditions. If this is so, how do ultrasonic waves exert this effect? Is ultrasonically treated milk produced commercially?*

A.—Ultrasonic treatment of milk will not alone impart to it long-keeping properties. The treatment, however, does so stabilize the milk emulsion that no detectable damage occurs when the milk is deep-frozen. Milk which has had such a combined treatment can then be stored under deep-freeze conditions for several years without any spoilage taking place. The thawed-out product is indistinguishable from the original. Provided deep-freeze storage facilities are available the product can be likewise stored successfully even in tropical countries for very long periods.

Frozen milk of this type is being made in this country on a large scale and is being exported. Manufacture is also being undertaken in other countries.

REFERENCES

1 Wearmouth, W. G., *J. Refrig.*, 1960, **3**, 56.
2 —— *Dairy Engng*, 1957, **74**, 193.

Intravenous Dextran and Plasma Volume

Q.—*How rapidly is intravenous dextran metabolized and excreted, and does this correspond with the time it is effective as an expander of the plasma volume?*

A.—Dextran is metabolized slowly in man over a period of several months,[1] but the time during which it will remain in the circulation and act as a effective expander of the plasma volume is related to the molecular weight of the material infused. Dextran particles of molecular weight below 50,000 tend to diffuse through the capillary wall into the tissue fluid or are excreted rapidly via the kidney. Present-day preparations are highly fractionated, and the molecular weight of most of the particles in British dextran solutions lies between 125,000 and 250,000. Such material is well retained within the blood vessels, and, in general, not more than 10% is excreted in the urine within 24 hours and only 15 to 20% in 48 hours.[2] During this time, therefore, the dextran remains effective as an expander of the plasma volume.

REFERENCES

1 Squire, J. R., Bull, J. P., Maycock, W. d'A., and Ricketts, C. R., *Dextran: Its Properties and Use in Medicine*, 1955. Blackwell, Oxford.
2 Wilkinson, A. W., and Storey, I. D. E., *Lancet*, 1953, **2**, 956.

Correction.—In the Medical Memorandum by Drs. M. D. McGrath and R. G. Paley (November 5, page 1364) the chloride radical was inadvertently omitted from the formula for chlorpromazine with the result that the formula actually denoted promazine.

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

Refresher Course for General Practitioners, Volumes 2 and 3 (26s. 9d. each).
Clinical Pathology in General Practice (22s. 3d.).
Any Questions?, Volumes 2 and 3 (8s. 3d. each).

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.
Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.
ADVERTISEMENTS should be addressed to the Advertisement Director, B.M.A. House, Tavistock Square, London W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7 Drumsheugh Gardens, Edinburgh.